# Smithsonian

AUGUST 2001

## The Desert Fox Goes to Town

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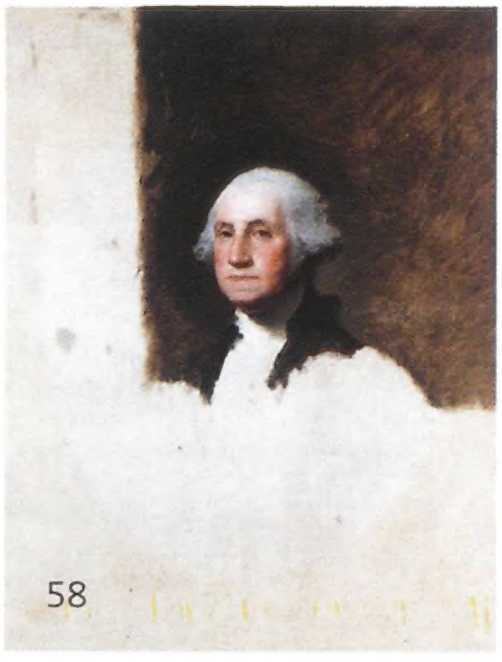


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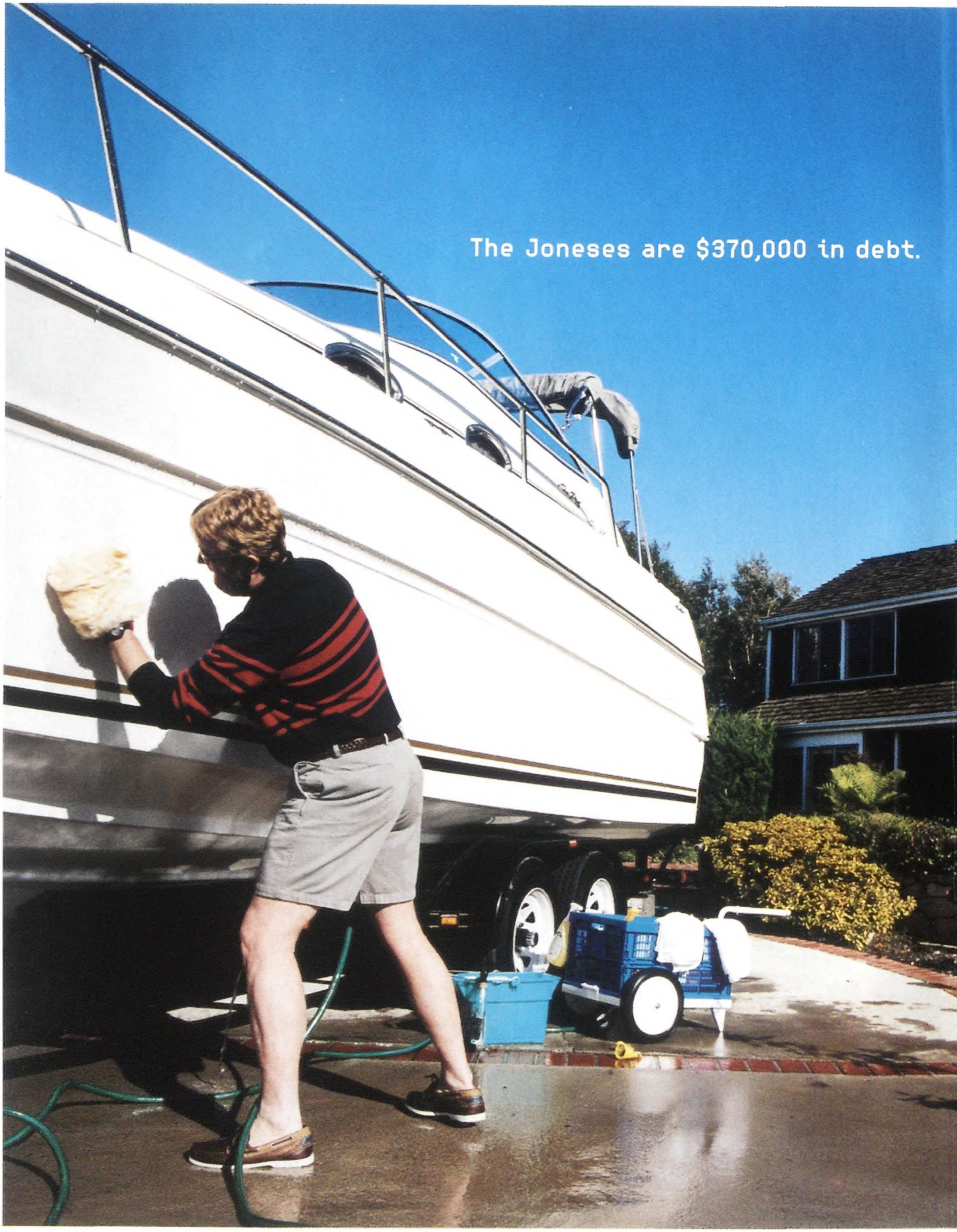


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# departments

AUGUST 2001 ♜ VOLUME 32, NUMBER 5

Cover The diminutive San Joaquin kit fox weighs a mere three to five pounds, about the size of an average house cat. One of the first species to be listed under the 1966 federal Endangered Species Protection Act, California's kit fox has continued to warrant a federal endangered listing. The resourceful little canid is managing to hang on though, making its home on protected lands and in suburban developments.

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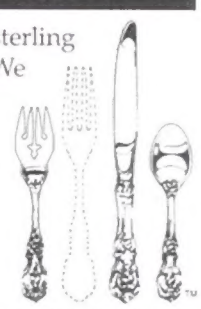

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# A Gift to the Nation

## A NOTE FROM THE SECRETARY

BY THE 1790S GEORGE WASHINGTON HAD BECOME emblematic of America, and Americans knew it. He held the nation steady, and his example gave reality to its ideals. "He has so much martial dignity in his deportment. . . . There is not a king in Europe that would not look like a valet de chambre by his side," said the physician Benjamin Rush of the imposing Washington, who stood inches above six feet when the norm was to stop inches below. In the final year of Washington's Presidency, his portrait was painted, life-size, by the renowned American artist Gilbert Stuart. Stuart actually did a number of portraits of the President, including the head that has had so famous an afterlife on the American dollar bill, and he made many replicas. The portraits helped deliver Washington's image to history. And none did so more emphatically than Stuart's life-size Washington.

Gilbert Stuart's 1796 portrait of Washington is temporarily on display in the American History museum.

The portrait was commissioned by a wealthy American couple, Mr. and Mrs. William Bingham, as a gift to a British statesman, the marquess of Lansdowne. Washington was 64 years old, and a little more than three years from his death, when Stuart fulfilled the commission. We know from other contemporary pictures of the President that he was visibly an old man, but Stuart banished time's mischief from the portrait. His Washington is a mature figure certainly, and yet the years have left the President's features smooth. Regal as any king, though pointedly not a king, he stands for the inspection of his countrymen, the world and the future. He wears civilian clothes—a black velvet suit—rather than the military uniform that had been his attire in other full-length pictures. In him are plainly visible the aspirations of the new democratic America, where an individual of even Washington's majesty would eventually leave high office and resume the life of an ordinary citizen.

The finished portrait—known today as the Lansdowne—was sent to England, where it changed hands over the years and passed to the fifth earl of Rosebery. In 1968 the earl's grandson lent the picture to the Smithsonian for the opening of the National Portrait Gallery, and it has had a home in the gallery ever since. Then, last year, came unexpected news: the current owner notified the Smithsonian that he intended to put the painting up for sale. The Institution was welcome to purchase it, however, on exclusive terms in advance of a public auction—by April 2001, and for $20 million.

The painting had become so familiar a part of the lore of America's beginnings that there was no conceiving the emptiness—not of space but of spirit—that would follow its removal from the Portrait Gallery. There must have been a special providence in having the Smithsonian first go public with its appeal for funds on Washington's birthday. A flurry of newspaper articles, and the appearance of gallery director Marc Pachter on the *Today* show several days later, set in train a sequence of events that led quickly to an act of extraordinary and exemplary generosity by the board of the Donald W. Reynolds Foundation in Las Vegas. They made a gift of up to $30 million to the Smithsonian—and thereby made a gift of the Lansdowne Washington to America. The additional millions will send the picture on a national tour and provide for its permanent display in the Portrait Gallery when that museum reopens. (For more on Gilbert Stuart and the Lansdowne portrait, see p. 58.)

George Washington's America lay east of the Mississippi, and the first President probably did not imagine an America of today's scope and prosperity. Patriotic citizens from the America that Washington did not know—but that would not have been possible without his wisdom and courage—have now safeguarded an icon of the first days of the nation. The grand reach of their action, across time and geography, invites us to marvel once again at the astonishing good fortune of these United States.

LAWRENCE M. SMALL, SECRETARY

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# see the forest

for the trees.

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see the forest, period.

# LETTERS TO THE EDITOR

### WOMEN ATHLETES

I WAS BORN IN 1948, AND DURING my childhood my little sister Susie never played on a sports team. Today I have triplet daughters at Yale University, the U.S. Naval Academy and the U.S. Air Force Academy. They have climbed in the Himalayas, played almost every sport imaginable and want to be a CIA agent, a U.S. Marine officer and a fighter pilot, respectively.

After reading Sally Scott Maran's text block "Women Athletes Put On Their Game Face," in the June 2001 issue, I repeated to myself what my daughters have been telling me for years: "American women rock!"

*Robert William Zerby*
*St. Croix, U.S. Virgin Islands*

### LEANING TOWER OF PISA

DURING WORLD WAR II, WHEN THE Germans were in control of the north side of the Arno River in Pisa, we Americans could look across the river and watch the Germans using the Leaning Tower as an observation post. The tower made a tempting target, but the American monuments and fine arts officers warned us that it was not to be fired upon.

After the Germans left the area, I visited the tower. The climb to the top was difficult but worth the effort. I discovered that the Germans had painted compass points on the top as an aid to directing artillery fire. At that time a plaque showed the spot where Galileo had stood when he dropped weights to prove his theory of the uniform acceleration of gravity.

*Dick Herboldshimer*
*Fresno, California*

I ENJOYED YOUR FASCINATING STORY about the efforts to save the Leaning Tower of Pisa; however, one phrase bothered me. Was it necessary to describe tenor Andrea Bocelli as "the blind tenor Andrea Bocelli"? Unless he was planning to rappel down the side of the tower during his performance, his blindness had nothing to do with his singing at the reopening.

*Joanne Chamberlin*
*Pittsburgh, Pennsylvania*

### BENJAMIN FRANKLIN

GEORGE III WAS THE GRANDSON OF King George II, not his son, as your article "Dr. Franklin's Plan" stated.

*Rick H. Falk*
*Milwaukee, Wisconsin*

**George III's father was Frederick Louis, Prince of Wales, who predeceased his father, King George II, by 9 years in 1751. Ed.**

### BRITISH MUSEUM

I'M SO GLAD THAT DOUG STEWART credited "the redoubtable Sir W. M. Flinders Petrie" with being the father of scientific archaeology as well as having been a contributor of certain objects that are being displayed in traveling exhibitions now on loan from the British Museum.

While the British Museum may house the largest collection of Egyptian art outside of Cairo, a few blocks away the Petrie Museum of Egyptian Archaeology at University College London, known mainly to serious students of Egyptology, has long been considered a hidden treasure.

*Carol L. Senty*
*West Des Moines, Iowa*

### THE OBJECT AT HAND

THANK YOU FOR JULIE WAKEFIELD'S column "Painted Ladies in Space," which spoke of SPACEHAB, Inc.'s global space education program, formerly known as S*T*A*R*S. We have made changes since you went to press. The program is now called STARS Academy (www.starsacademy.com). I am its new manager. While S*T*A*R*S recruited schools as participants, the revamped STARS Academy enrolls individual students. Our locker full of student experiments, slated for shuttle mission STS-107, has been delayed beyond April 2002.

*Jim Royston, Acting President*
*Space Media, Inc.*
*Titusville, Florida*

THE PAINTED LADY CATERPILLAR does not spin a cocoon, as your column stated. Instead, the caterpillar attaches a small pad of silk to a solid surface and suspends itself from the pad by its body's last two pseudopods. The caterpillar then molts (pupates): its skin splits down the back and a chrysalis emerges. The butterfly metamorphosis continues within.

Some moths spin silk cocoons, but they do not "slip inside." The caterpillar weaves a web around itself until it is completely encased and then pupates inside this casing.

*Moria Starbuck*
*Redwood Valley, California*

### TABLE OF CONTENTS

THE ENUMERATION ON YOUR TABLE of Contents page in the June 2001 issue was incorrect. It should have been Volume 32, Number 3.

*Judith C. Ferrell*
*Elkhart Public Library*
*Elkhart, Indiana*

### WRITE TO SMITHSONIAN

Letters for consideration in this column must include your daytime telephone number, full name and postal address. Letters may be edited for clarity and length. Our address is Smithsonian Letters Editor, P.O. Box 50383, Washington, D.C. 20091-0383. Transmit e-mail to LettersEd@simag.si.edu.

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# Camping at the Zoo

POPULAR "SNORE AND ROAR" SLEEPOVERS GIVE VISITORS AN UP CLOSE NIGHTTIME ADVENTURE WITH ANIMALS

BY MICHAEL KERNAN

With beams trained on a dusky path, a group of campers sets out on the flashlight tour of nocturnal animals, a highlight of the Zoo sleepover.

"GOT A GREAT ASSIGNMENT FOR YOU," my editor said, "the Snore and Roar program. You spend the night in a tent at the Zoo."

So there I was on Lion Tiger Hill, setting up a tent under the sharp eye of security officer Vincent Parker, who would look after us and our belongings and check for inclement weather throughout the night. There were 26 of us, including eight children and two teenagers, participating in this sleepover at the Smithsonian's National Zoo.

"You'll have no trouble waking up," Debbie Brown, our host, told me. By day she's a preschool teacher in nearby Annandale, Virginia, and in the summer she teaches safari classes to youngsters at the Zoo.

"You will be roused, all right," Brown said. "Sometimes the lions start roaring around 6 A.M., muted at first from inside and then louder when the keepers let them out. Lions reestablish their territory by roaring. It's very guttural and sort of vibrates the ground. It carries very well."

After Brown gave us some tips for pitching our tents and everyone had them up, it was time for snacks: vegetables, dip, cheese and crackers, and animal cookies. The sun was down and a chill seeped down the hill as day visitors hurried to their cars.

Last year, from May through October, some 950 people took part in 45 Snore and Roars, and this year the program is being expanded. The cost is $40 a person. The campouts attract "mostly families," Brown told me, "though we have adults-only night too. We serve wine with the snacks."

Though the children are no problem, she assured me. They rarely experience any nighttime panic. "They're too tired after the flashlight tour. It gets very quiet very fast here."

As the dusk deepened, I could see several small boys racing about doing what small boys do in tents, crawling in and out, flashing their flashlights, arranging their stuff.

One of my tent neighbors was Jim Eanes and his wife, Karen, and daughter Elizabeth, 12, from nearby Ellicott City, Maryland. Karen's sister Linda Girdner was here also with husband Jan Hoff and son Devon Hoff, 13. It was Linda's 50th birthday, and the campout was her present.

This was the night to tour the Great Ape House. Every Snore and Roar group gets an up close visit to one of the major Zoo houses with a keeper. We met keeper Nicole Meese, who made us promise not to shine flashlights in the animals' faces. Then we met the gorillas.

Their life is a soap opera, it seems. Who is mating with whom, how the teenagers are behaving, what the babies get for breakfast: it's a saga.

"Now there's Baraka making his nest for the night," Meese announced to campers. "Baraka is 9, and he's a subadult male, sort of a teenager. Kuja, the leader of the family group and a silverback, is about 18. And

*For people with type 2 diabetes*

# "Taking care of my diabetes takes real commitment. Always."

"I do want to be stronger than diabetes. I want to do this for myself, and for Eileen — my wife and best friend.

"So, I will always take care of myself. It was tough at first, but I got into a good diet and exercise routine. That still wasn't enough, so my doctor added *Avandia* for my type 2 diabetes. It helps my body use its own natural insulin more effectively.

"It's been a year now, and I've kept my blood sugar down — with the help of *Avandia*. Your results may vary."

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*Avandia*, along with diet and exercise, helps improve blood sugar control. It may be prescribed alone, with Glucophage® (metformin HCl tablets) or with sulfonylureas. When taking *Avandia* with a sulfonylurea, you may be at risk for low blood sugar. Ask your doctor whether you have to lower your sulfonylurea dosage.

*Avandia* is not indicated for use with insulin. In some people, *Avandia* may cause fluid retention, or swelling. This could lead to or worsen congestive heart failure, so tell your doctor if you have a history of these conditions. *Avandia* is not for everyone. If you have severe heart failure or active liver disease, *Avandia* is not recommended. If you experience an unusually rapid increase in weight, swelling or shortness of breath while taking *Avandia*, talk to your doctor immediately.

Also, blood tests to check for serious liver problems should be conducted before and during *Avandia* therapy. Tell your doctor if you have liver disease, or if you experience unexplained tiredness, stomach problems, dark urine or yellowing of the skin while taking *Avandia*. See important patient information on the following page.

If you are nursing, pregnant or thinking about becoming pregnant, talk to your doctor before taking *Avandia*.

**Talk to your doctor, or for more information call 1-800-AVANDIA (1-800-282-6342) or visit www.avandia.com**

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Avandia®
rosiglitazone maleate

**You can be stronger than diabetes**

# Patient Information about AVANDIA® (rosiglitazone maleate) 2 mg, 4 mg, and 8 mg Tablets

**What is *Avandia*?**
*Avandia* is one product in a class of prescription drugs called thiazolidinediones (thigh-a-zoe-lid-een-die-owns) or TZDs. It is used to treat type 2 diabetes by helping the body use the insulin that it is already making. *Avandia* comes as pills that can be taken either once a day or twice a day to help improve blood sugar levels.

**How does *Avandia* treat type 2 diabetes?**
If you have type 2 diabetes, your body probably still produces insulin but it is not able to use the insulin efficiently. Insulin is needed to allow sugar to be carried from the bloodstream into many cells of the body for energy. If insulin is not being used correctly, sugar does not enter the cells very well and builds up in the blood. If not controlled, the high blood sugar level can lead to serious medical problems, including kidney damage, blindness and amputation.

*Avandia* helps your body use insulin by making the cells more sensitive to insulin so that the sugar can enter the cell.

**How quickly will *Avandia* begin to work?**
*Avandia* begins to reduce blood sugar levels within 2 weeks. However, since *Avandia* works to address an important underlying cause of type 2 diabetes, insulin resistance, it may take 8 to 12 weeks to see the full effect. If you do not respond adequately to your starting dose of *Avandia*, your physician may increase your daily dose to improve your blood sugar control.

**How should I take *Avandia*?**
Your doctor may tell you to take *Avandia* once a day or twice a day (in the morning and evening). It can be taken with or without meals. Food does not affect how *Avandia* works. To help you remember to take *Avandia*, you may want to take it at the same time every day.

**What if I miss a dose?**
If your doctor has prescribed *Avandia* for use once a day:

- As soon as you remember your missed dose, take one tablet anytime during the day.
- If you forget and go a whole day without taking a dose, don't try to make it up by adding another dose on the following day. Forget about the missed dose and simply follow your normal schedule.

If your doctor has prescribed *Avandia* for use twice a day:

- As soon as you remember the missed dose, take one tablet.
- Take the next dose at the normal time on the same day.
- Don't try to make up a missed dose from the day before.
- You should never take three doses on any single day in order to make up for a missed dose the day before.

**Do I need to test my blood for sugar while using *Avandia*?**
Yes, you should follow your doctor's instructions about your at-home testing schedule.

**Does *Avandia* cure type 2 diabetes?**
Currently there is no cure for diabetes. The only way to avoid the effects of the disease is to maintain good blood sugar control by following your doctor's advice for diet, exercise, weight control, and medication. *Avandia*, alone or in combination with other antidiabetic drugs (i.e., sulfonylureas or metformin), may improve these other efforts by helping your body make better use of the insulin it already produces.

**Can I take *Avandia* with other medications?**
*Avandia* has been taken safely by people using other medications, including other antidiabetic medications, birth control pills, warfarin (a blood thinner), Zantac® (ranitidine, an antiulcer product from GlaxoSmithKline), certain heart medications, and some cholesterol-lowering products. You should discuss with your doctor the most appropriate plan for you. If you are taking prescription or over-the-counter products for your diabetes or for conditions other than diabetes, be sure to tell your doctor. Sometimes a patient who is taking two antidiabetic medications each day can become irritable, lightheaded or excessively tired. Tell your doctor if this occurs; your blood sugar levels may be dropping too low, and the dose of your medication may need to be reduced.

**What should I discuss with my doctor before taking *Avandia*?**
*Avandia*, like other TZDs, may cause fluid retention or swelling in some people. This could lead to or worsen congestive heart failure, particularly in people taking insulin. *Avandia* is not indicated for use with insulin. Talk to your doctor if you have a history of heart failure or swelling. You should also talk to your doctor if you have liver problems, or if you are nursing, pregnant or thinking of becoming pregnant. If you are a premenopausal woman who is not ovulating, you should know that *Avandia* therapy may result in the resumption of ovulation, which may increase your chances of becoming pregnant. Therefore, you may need to consider birth control options.

**What are the possible side effects of *Avandia*?**
*Avandia* was generally well tolerated in clinical trials. The most common side effects reported by people taking *Avandia* were upper respiratory infection and headache. As with most other diabetes medications, you may experience an increase in weight. You may also experience edema (swelling) and/or anemia. If you experience any swelling of your extremities (e.g., legs, ankles) or tiredness, notify your doctor. Talk to your doctor immediately if you experience edema, shortness of breath, an unusually rapid increase in weight, or other symptoms of heart failure.

**Who should not use *Avandia*?**
You should not take *Avandia* if you are in the later stages of heart failure or if you have active liver disease. The following people should also not take *Avandia*: People with type 1 diabetes, people who experienced yellowing of the skin with Rezulin® (troglitazone, Parke-Davis), people who are allergic to *Avandia* or any of its components and people with diabetic ketoacidosis.

**Why are laboratory tests recommended?**
Your doctor may conduct blood tests to measure your blood sugar control. Blood tests to check for serious liver problems should be conducted before starting *Avandia*, every 2 months during the first year, and periodically thereafter.

It is important that you call your doctor immediately if you experience unexplained symptoms of nausea, vomiting, stomach pain, tiredness, anorexia, dark urine, or yellowing of the skin.

**How should I store *Avandia*?**
*Avandia* should be stored at room temperature in a child-proof container out of the reach of children. Store *Avandia* in its original container.

GlaxoSmithKline

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Separated by glass, Bonnie, a 25-year-old orangutan, and a young visitor share a moment in which both seem equally transfixed.

Mandara is 19; she's the only female in the group. Their son is Kwame, who is about 16 months old."

Baraka sat at the back of the habitat strewing hay all over himself with grave deliberation. Pretty soon Mandara flipped the baby onto her back and loped over to the window, where she sat staring at us. When some of the boys drifted off, she pounded on the glass to get our attention again. But she wasn't the star of the show. It was the baby.

Kwame peered at us for a while, looking like a wizened little farmer, with a straw sticking jauntily from his mouth. Then he lay flat on his back. Then he did a somersault. Then he clambered up a tree and fell off. Then he climbed on a rope and fell off. Then he scratched his small round head, looking now like a little farmer wondering if it was going to rain. Everyone cracked up.

He has a white spot on his rear end, which he showed us several times. The spot tells the other gorillas that this is a baby and should be indulged, Meese said. Human babies could use something like that.

"They eat carrots, green beans, sweet potatoes, celery, fruit—and some meat once a week. They also get special zoo chow," Meese said,

*When Mopie is moved out of his cage, it takes ten keepers to squeeze him through the door.*

offering us the hard, dry biscuits. They weren't bad. Dipped in sherry, with a bit of butter, they might go down quite nicely.

"In this next enclosure we have Mopie, who is 29, and Kigali, the half sister of Baraka," Meese continued. Gorilla family dynamics are complex. And since they are very social, they are never housed singly.

Mopie loves children, we were informed. Adults are asked to sidle up to gorillas and not face them directly right away. But it's OK for children. Last year at Halloween, Meese said Mopie was so fascinated by the visiting children in their costumes—who are these bizarre creatures?—that he stayed up long after his regular bedtime. He weighs about 450 pounds. When Mopie is tranquilized and moved out of his cage, it takes ten keepers to squeeze him through the door.

On to the orangutans.

"Now Bonnie here is very intelligent," Meese said. "These animals are smarter than people think. Bonnie walks on two feet most of the time. She's 25, and she's living with Junior. They have a son, Kiko."

Bonnie came straight up to the window to study us. Junior was just a pile of stringy orange hair in the

After their ambitious night ramble among the animals, "Snore and Roar" campers bed down in Zoo-issued tents pitched on Lion Tiger Hill.

corner, wrapped in a burlap blanket.

"Sometimes Bonnie makes herself a waterfall. She jams a straw into the waterspout to turn it on and get it to flow continuously. One morning we found her sitting under the waterspout with a piece of cardboard over her head like an awning."

Suddenly Junior decided to check us out. He got up and ambled over. He was enormous. His hair looked to be a yard long. A minute later he went back to curl up on his tarp and go to sleep. Junior is the one who famously ventured onto the O Line, the elevated wirewalk between ape houses, then, apparently undaunted, climbed down an electrified tower right onto the ground, much to the astonishment of Zoo staff and visitors. He was quickly darted by the vet.

Meese showed us a plastic gorilla skull with its inch-high ridges along the top. These hold in place the prodigious jaw muscles they need for chewing greens all day. They have canine teeth, too, for fighting.

After leaving the ape house, Debbie Brown led us out into the night to visit some of the outdoor nocturnals. We saw maras, huge rodents that appear to have been designed by committee: deer legs and cavy heads. There were macaques, a coati and a sleepy caracal with gleaming eyes named Martina, whose tall ears have tufts that help her slink unnoticed through the tall grasses.

People were beginning to peel off for the night as we headed on to see

*The orang sits down on the blanket with them. They give her a sandwich; she takes them all.*

Gunnar and Selkie, the seals, and the sloth bears and the brown bear named Kiska, whom we awoke from a sound sleep. Kiska likes to show off her soccer skills with a large ball that she boots up a ramp, but not at night.

It was nearly 11. A hardy band headed for the elephants and the camels, but I headed for my tent. I could see the stars through the mesh, and as I lay in my sleeping bag the smell of the ground cloth brought back scenes of camping years ago with the children in places like Yosemite and Big Basin State Park.

Years ago, indeed. I had forgotten how hard the ground was. It kept me tossing until about 1 A.M.

It was not the lions that woke us all. It was the gibbons. They give long clarinetish hoots to tell the world "I am here and what you gonna do about it?" We crawled from the tents and ran for the coffee table.

Debbie Brown joined us at the breakfast buffet and shared this eye-opening story: some years ago an orangutan got loose. The keepers were running everywhere searching for her, and an alarm went out: Everyone go back to your cars! Well, a German couple visiting Washington were having a picnic on the grass. They heard the alarm but apparently did not understand English and did not heed the warning.

Pretty soon this orangutan comes shuffling down the path and stares at them. They figure this is one of those hands-on modern zoos and think nothing of it. Then the orangutan sits down on the blanket with them. They give her a sandwich. She takes them all. Well, OK.

Then a keeper rushes up. He does not panic. He offers the orang her favorite food, sugarless bubble gum. She takes it and goes off with the keeper, hand in hand, to her cage.

Hand in hand. That's what I heard

While Brown organized the younger campers for a scavenger hunt, I joined Linda and Jan for a walk. Linda slept the whole night, she said, thanks to an egg-crate sponge mattress. In the early quiet, before the crowds arrived, the animals seemed playful and alert Two elephants gently butted head-to-head on a ramp: Was it a power thing or just a game? Walkers and joggers streamed through the Zoo in the dawn. We folded our tents and started for the parking lot.

## Looks like the L.L.Bean fall catalog is here.

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THE OBJECT

AT HAND

# Meet Me at the Automat

## HORN & HARDART GAVE BIG CITY AMERICANS A TASTE OF GOOD FAST FOOD IN ITS CHROME-AND-GLASS RESTAURANTS

BY CAROLYN HUGHES CROWLEY

Horn & Hardart Automat facades generally resembled this one at 115 East 14th Street in New York City, photographed at Christmastime, circa 1960.

IT WAS ONCE THE WORLD'S LARGEST restaurant chain, serving 800,000 people a day. It was Horn & Hardart, and its cavernous, waiterless establishments represented a combination of fast-food, vending and cafeteria-style eateries. These restaurants, with their chrome-and-glass coin-operated machines, brought high-tech, inexpensive eating to a low-tech era. Making their debut in Philadelphia in 1902, just up the street from Independence Hall, and reaching Manhattan in 1912, Horn & Hardart Automats became an American icon, celebrated in song and humor. With their uniform recipes and centralized commissary system of supplying their restaurants, the Automats were America's first major fast-food chain.

Although no longer a commercial enterprise, the Automat nonetheless has survived as a relic of Americana. Beautifully ornate with its mirrors, marble and marquetry, a 35-foot piece of Philadelphia's 1902 Horn & Hardart is in the Smithsonian's National Museum of American History.

Founded by Joseph Horn and German-born Frank Hardart, the restaurants were a new concept in food service, borrowed from a successful German eatery. The Automats immediately captured America's interest and imagination. They were the restaurant industry's first attempt at emulating the assembly line.

Customers put together their own meals in a continuous, moving operation. Hot food was always hot—and savory. Automats, moreover, always sought to offer the widest possible variety of culinary choices.

In huge rectangular halls filled with shiny, lacquered tables, women with rubber tips on their fingers—"nickel throwers," as they became known—in glass booths gave customers the five-cent pieces required to operate the food machines in exchange for larger coins and paper money. Customers scooped up their nickels, then slipped them into slots in the Automats and turned the chrome-plated knobs with their porcelain centers. In a few seconds the compartment next to the slot revolved into place to present the desired cold food to the customer through a small glass door that opened and closed. Diners picked up hot foods at buffet-style steam tables.

The word "automat" comes from the Greek *automatos*, meaning "self-acting." But Automats weren't truly automatic. They were heavily staffed. As a customer removed a compartment's contents, a behind-the-machine human quickly slipped another sandwich, salad, piece of pie or coffee cake into the vacated chamber.

Customers found many advantages in this style of dining. They could see the food before buying it. They thought the glass-fronted compartments and shiny fittings were sanitary, a comforting reassurance after the food contamination scares of the time.

Patrons were discouraged from tipping. Nor did any

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cash register reveal the cost of a meal for all to see; the coin slots kept thrifty customers' dining expenditures discreetly hidden.

Diners could sit wherever they chose. Automats could be great equalizers because paupers and investment bankers might sit together at the same table. And Automats were something special to children. With a handful of change, they could choose a meal from foods they liked.

Horn & Hardart Automats had a strict fresh-food policy. No food could be left overnight in any of its restaurants—or its retail shops (whose motto was "Less Work for Mother"), which sold prepackaged Automat food. After closing time each day, Horn & Hardart trucks carried surplus food to "day-old" shops. New York and Philadelphia each had three, located in low-income neighborhoods, which sold these items at reduced prices.

**Long before specialty coffee shops pervaded America, Horn & Hardart featured fine, fresh-brewed coffee, priced for many years at just five cents a cup.**

Automats enforced quality control. The leather-bound rule book every manager received listed the proper handling of the nearly 400 menu items, described precisely where to position the buffet-style food on the plates and stated the number of times employees were to wipe tabletops each day.

Daily, founders Horn and Hardart and other executives lunched together at the Sample Table (or the "ulcer table," as some disgruntled workers dubbed it). To test for quality and uniformity, they ate regular items and offered suggestions for new ones. And they judged whether new ingredients that outside suppliers offered were superior to those that were already in use.

Between courses, samplers sipped black coffee. Each day that beverage came from a different Horn & Hardart outlet. In this way, Horn & Hardart performed spot checks on coffee, the most commonly ordered item. The precise amount gushed from the mouth of a chrome dolphin's head (copied from a Pompeian fountain) at an exactly calibrated temperature.

Horn & Hardart's coffee became known as the best in town. In their heyday in the 1950s, Automats sold more than 90 million cups of fresh-brewed coffee each year. From 1912 to 1950, a cup cost a nickel.

Horn & Hardart introduced the first fresh-drip brewed coffee to Philadelphia and New York. Before then, coffee on the East Coast had been a harsh, brackish drink made by boiling it interminably with eggshells to clarify it.

After brewing each batch of their coffee, Horn & Hardart employees filled out a time card. After 20 minutes, they discarded whatever coffee remained and prepared more. Irving Berlin, the composer of "God Bless America," wrote a famous song about this delicious brew, "Let's Have Another Cup of Coffee," which became Horn & Hardart's theme song.

For diners who were really in such a rush, the company provided stand-up counters similar to those that banks provide for writing deposit slips. These people ate what became known as "perpendicular meals."

But Horn & Hardart had a restaurant for every kind of clientele. Philadelphia's Automats were haunts for actors, hotel guests and merchants along Jewelers Row. Though Horn & Hardart did not allow smoking, Walter Winchell and other journalists ate at New York's Automats. The restaurants didn't hustle folks out who lingered over their meal—or even those who bought no food.

Automats fell victim to consumers' changing tastes. Perhaps people tired of cafeteria-style food. Many no longer ate a full meal at lunch. Americans moved into the suburbs and didn't come downtown as often, so night business at Automats fell too. With lower labor and food costs, the modern kind of fast-food restaurants, such as McDonald's, White Castle and theme-food emporiums, competed too successfully.

In the 1970s Horn & Hardart replaced its dying restaurants with Burger King franchises. The generation that ate at these new fast-food outlets didn't miss the charm of Automats' fancy fixtures and diverse menu. Upscale power lunchers had no use for Automats' simple fare.

The last Automat closed in New York City in 1991, lamented by those who remembered what the chain had stood for: quality, service and cleanliness.

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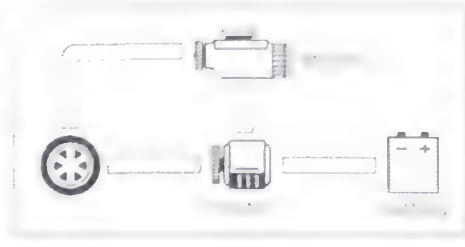

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HIGHLIGHTS

Elegant Lady Wanyan, wife of Prince Hongming, is bedecked with formal jewelry. Her headdress, adorned with five phoenix ornaments of gold and pearl, connotes high rank within the Qing dynasty (1644 to 1911). Chinese ancestor portraits, like this one from c. 1767, were displayed by descendants during annual ceremonies to pay tribute to forebears. When the Qing dynasty fell, many of the portraits were sold. Eventually a number of them were obtained from rancher and art collector Richard G. Pritzlaff by the Arthur M. Sackler Gallery. Thirty-eight images plus numerous objects are on view through September 9 in the exhibition "Worshiping the Ancestors: Chinese Commemorative Portraits." *—Aili Petersen*

# How will you take care of your high cholesterol and heart disease?

I've always loved to dance. So I was thrilled when my oldest grandson wanted to follow in my footsteps. But before our first lesson, I had a heart attack. I needed to lower my cholesterol. Diet and exercise didn't do it—my cholesterol was still too high. So I asked my doctor about adding ZOCOR. **ZOCOR is an effective medicine that along with diet and exercise can significantly lower total cholesterol.** A clinical study among people with high cholesterol and heart disease found 42% fewer deaths from heart attack among those taking ZOCOR.[1] One tablet, taken once a day, can help people with high cholesterol and heart disease live a longer, healthier life. **Important considerations:** ZOCOR is a prescription medicine and isn't right for everyone, including women who are nursing or pregnant or who may become pregnant, anyone with liver problems, and people who are allergic to any ingredients of ZOCOR. Unexplained muscle pain or weakness could be a sign of a rare but serious side effect and should be reported to your doctor right away. Your doctor may do blood tests before and during treatment with ZOCOR to check for liver problems. To avoid serious side effects, discuss with your doctor medicine or food you should avoid while on ZOCOR (see details immediately following this ad). **Ask your doctor if ZOCOR is right for you. For more information call 1-888-6-MERCK-5 or visit www.zocor.com.**

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**Women who are breast-feeding** should not take ZOCOR.

### WARNINGS

**Muscle: Tell your doctor right away if you experience any unexplained muscle pain, tenderness, or weakness at any time during treatment with ZOCOR so your doctor can decide if ZOCOR should be stopped. Some patients may have muscle pain or weakness while taking ZOCOR. Rarely, this can include muscle breakdown resulting in kidney damage. The risk of muscle breakdown is greater in patients taking certain other drugs along with ZOCOR, such as the lipid-lowering drug Lopid (gemfibrozil), and other fibrates; lipid-lowering doses of niacin (nicotinic acid); Sandimmune (cyclosporine); itraconazole, ketoconazole, and other azole antifungal drugs; the antibiotics erythromycin and clarithromycin; HIV protease inhibitors; the antidepressant nefazodone; and the calcium channel blocker verapamil. Interruption of therapy with ZOCOR should be considered if you are going to take an azole antifungal medication, such as itraconazole, or macrolide antibiotics, such as erythromycin. Avoid drinking large quantities of grapefruit juice (more than one quart daily) while on ZOCOR. The risk of muscle breakdown is greater in patients with kidney problems or diabetes.**

**Because there are risks in combining therapy with ZOCOR with the products listed above, your doctor should carefully weigh the potential benefits and risks. He or she should also carefully monitor patients for any muscle pain, tenderness, or weakness, particularly during the initial months of therapy and if the dose of either drug is increased. Your doctor also may monitor the level of certain muscle enzymes in your body, but there is no assurance that such monitoring will prevent the occurrence of severe muscle disease.**

**If you have conditions that can increase your risk of muscle breakdown, which in turn can cause kidney damage, your doctor should temporarily withhold or stop ZOCOR. Also, since there are no known adverse consequences of briefly stopping therapy with ZOCOR, treatment should be stopped a few days before elective major surgery and when any major acute medical or surgical condition occurs. Discuss this with your doctor, who can explain these conditions to you.**

**Liver: About 1% of patients who took ZOCOR in clinical trials developed elevated levels of some liver enzymes.** Patients who had these increases usually had no symptoms. Elevated liver enzymes usually returned to normal levels when therapy with ZOCOR was stopped.

In the ZOCOR S[illegible] to greater than 3 times the norm[illegible] Only 8 patients on ZOCOR and 5 on placebo discontinued therapy due to elevated[illegible] Patients were started on 20 mg of ZOCOR, and one third had their dose raised to 40 mg.

**Your doctor should perform routine blood tests to check these enzymes before you start treatment with ZOCOR and periodically thereafter (for example, semiannually) for your first year of treatment or until 1 year after your last elevation in dose. Patients titrated to the 80-mg dose should receive an additional test at 3 months.** If your enzyme levels increase, your doctor should ord[illegible] high, your doctor should di[illegible]

Tell your doctor about any l[illegible] consume. ZOCOR should [illegible]

### PRECAUTIONS

Before starting treatm[illegible] exercise, and weight loss. Ask your doctor about how best to do this. Any other medical problems that can cause high cholesterol sho[illegible]

**Drug Interactions:** [illegible]

**Central Nervous System Toxicity; Cancer, Mutations, Impairment of Fertility:** Like prescription drugs, ZOCOR was required to be tested on animals before it was marketed for human [illegible]

**Pregnancy:** [illegible]

**Nursing Mothers:** [illegible]

**Pediatric Use:** ZOCOR is not recommended for children or patients under 20 years of age.

**Geriatric Use:** Higher [illegible]

### SIDE EFFECTS

**Digestive System:** C[illegible]

**Muscle, Skeletal:** Muscle cramps, aches, pain, and weakness; joint pain; muscle breakdown.

**Nervous System:** Dizziness, headache, ins[illegible] weakness and/or loss of sensation and/or abnormal sensations; anxiety; [illegible]

**Skin:** Rash, itching, hair loss, dryness, nodules, discoloration.

**Eye/Senses:** Blurred vision, altered taste sensation, progression of [illegible]

**Hypersensitivity (Allergic) Reactions:** On rare occa[illegible]

**Other:** Loss of sexual desire, breast enlargement, impotence.

**Laboratory Tests:** Liver function test abnormalities including elevated alk[illegible] bilirubin, thyroid function abnormalities.

**NOTE: This summary provides important information about ZOCOR. If you would like more information, ask your doctor or pharmacist to let you read the complete prescribing information and then discuss it with them.**

[illegible] Co., Inc.
[illegible]

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Whitehouse Station, NJ 08889

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SMITHSONIAN

HIGHLIGHTS

## Exhibitions and Events

### NATIONAL MUSEUM OF NATURAL HISTORY

*The IMAX & Jazz Café* (every Friday, 5:30-10 P.M., indefinitely) Enjoy dinner, live jazz and IMAX films.
*The Immersion Cinema* (permanent) Features floor-to-ceiling, 48-foot-wide, 150-degree wraparound screens, as well as 50 interactive consoles that allow the audience to determine how the adventure unfolds.

### ART NIGHT ON THE MALL

The Sackler and Freer galleries, the Ripley Center's International Gallery and the Hirshhorn and African Art museums will remain open until 8 P.M., Thursdays, through August 30.

### GEORGE GUSTAV HEYE CENTER, NATIONAL MUSEUM OF THE AMERICAN INDIAN [NEW YORK CITY]

*Seth Eastman Watercolors: A Soldier Artist Among the Dakota* (through October 7) Fifty-six paintings document mid-19th-century Dakota life.
*Spirit Capture: Native Americans and the Photographic Image* (through July 21, 2002) Explores the meaning of photographic images of and by Native Americans and communicates their perspectives on Native cultural history.

### HIRSHHORN MUSEUM AND SCULPTURE GARDEN

*Directions—Tacita Dean* (through October 21) Two new works by the London-based artist-filmmaker.

### ARTS AND INDUSTRIES BUILDING

*Game Face: What Does a Female Athlete Look Like?* (through January 2, 2002) Photographs of female athletes of diverse races, ages and abilities.
*Brain: The World Inside Your Head* (through January 2, 2002) The basic workings of the brain, its evolution and development, and the nature of sleep and consciousness.

### FREER GALLERY OF ART

*Whistler in Venice, The First Set of Etchings* (through January 6, 2002) His response to the city is explored through etchings created there.

### NATIONAL MUSEUM OF AMERICAN HISTORY

*Within These Walls* (permanent) An 18th-century Georgian house and the stories of five families that lived in it.
*Piano 300: Celebrating Three Centuries of People and Pianos* (extended through October 21) More than two dozen historic pianos are showcased at the International Gallery of the Smithsonian's S. Dillon Ripley Center.

### NATIONAL MUSEUM OF AFRICAN ART

*In the Presence of Spirits: African Art from the National Museum of Ethnology, Lisbon* (through September 16) Objects used by royals, diviners and priests, from large, awe-inspiring masks to small, exquisitely crafted figures, reflect the influence of the supernatural throughout sub-Saharan Africa.

### SMITHSONIAN TREASURES TO GO

During the renovation of the Smithsonian American Art Museum, some 500 artworks will tour the country. This month, the Frye Art Museum (Seattle) hosts *Scenes of American Life*. (For more information, call 202-275-1500 or click on "Treasures to Go" at www.americanart.si.edu.)

### TRAVELING EXHIBITS FROM THE NATIONAL PORTRAIT GALLERY

During the renovation of the gallery, artworks from its collections will be on tour. Exhibitions on view this month include *Portraits of the Presidents from the National Portrait Gallery*, hosted by the Gerald R. Ford Presidential Museum (Grand Rapids), and *A Brush with History: Paintings from the National Portrait Gallery*, hosted by the National Museum of Western Art (Tokyo).

### CLOSED FOR RENOVATIONS

The Smithsonian American Art Museum and the National Portrait Gallery are scheduled to reopen in the fall of 2004. The Anacostia Museum will reopen this fall.

## SMITHSONIAN Website

### WWW.SMITHSONIANMAG.COM

At the Magazine's homepage, click on "Events" and go to the calendar to view on-line versions of exhibitions.

## Planning a Smithsonian Visit?

To receive a free Associates' planning packet, write to Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560-0010, or send your request via e-mail to: info@info.si.edu, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M.-5 P.M., Monday-Friday, 10 A.M.-4 P.M., Saturday-Sunday, or visit www.si.edu. Museums are generally open 10 A.M.-5:30 P.M. daily, except December 25. Parking is limited; Metrorail is convenient to most museums.

### THE CASTLE—INFORMATION CENTER

Upon arrival make your first stop the Castle's Smithsonian Information Center. At the Associates' Reception Desk, open 9 A.M.-4 P.M. daily, learn what's new at the Smithsonian and learn about other area attractions. Receive brochures, hear about your discount privileges and register for a Sunday morning behind-the-scenes members' tour of the Castle.

# THE trade SHOW OF SHOWS

IN LAS VEGAS THE MIRAGE IS FAMOUS FOR ITS WHITE TIGERS. The Riviera touts its Crazy Girl revue. At one intersection alone you can choose between a medieval joust, the Folies Bergere and a Heroes of Rock 'n' Roll musical show. But every year come November all of the city's glitzy stage productions are dwarfed by the biggest extravaganza of them all: Comdex.

**Comdex Eve, 4 P.M.** It's a blustery Las Vegas afternoon. In less than 24 hours more than 220,000 people will descend on Comdex, the grandest and most influential information technology trade show in the world. Mindful of that deadline, hundreds of workers on the floor of the massive Las Vegas Convention Center are racing the clock to finish the booths, stages and screening rooms in which thousands of new products will be displayed.

If some of the workers seem haggard, it is because over the past five days they personally have moved more than 12,000

**Hardware and software professionals and enthusiasts alike mill shoulder to shoulder (far right) on the first day of Comdex. The giant computer expo wows showgoers with techno-fanciful displays (right).**

# IN THE $12 BILLION BUSINESS EXPO INDUSTRY, LAS VEGAS COMDEX IS THE PREMIER ATTRACTION

BY DAVID DEVOSS ◆ PHOTOGRAPHS BY ERIC SANDER

A giant image of Microsoft's Bill Gates looms over the man himself as he gives the "state of the industry" opening speech at Comdex.

tons of freight, arranged 7,000 chairs and laid enough carpet to cover 21 football fields. The 250 miles of recently installed electrical cable crackle with ten million watts of power. More than 2,500 signs and banners festoon the town. But now, with the finish line almost in sight, most of the work has stopped because of a dispute pitting the International Brotherhood of Electrical Workers against the International Association of Theatrical Stage Hands. Appropriately enough, the dispute arises out of the convergence of modern technologies.

"The problem is plasma screens," explains James Wetterling, president of the company responsible for the exhibition's electrical services. The IBEW is responsible for fixed lighting and says it should do the installation because plasma screens are the same as computer monitors. IATSH handles programmable lights used in stage presentations and insists it should do the work.

By the time Comdex show director Rich Feeley arrives on the scene in a golf cart, calm has been restored, and the buzz and whir of power tools once more fills the air. "Comdex is like a small city," he sighs. "We spend five days building it, two days tearing it down and in between are responsible for the housing, feeding, entertainment and transportation of more than 200,000 people. Of course, there are problems. In 1997 the show drained so much power from the grid that we temporarily blacked out the Las Vegas Strip. Last year *Forbes*' hot air balloon, the *Capitalist Tool*, crashed. But many of our problems result simply from the rapid advance of technology."

**Comdex Eve, 8 P.M.** Every year Microsoft CEO Bill Gates opens Comdex with a "state of the industry" speech. Microsoft describes the address as a "visionary blueprint for the next generation of the Internet." In actuality, it is an extended commercial for Microsoft products. But that's OK with the 12,000 people packing the MGM Hotel's cavernous Garden Arena who shout "Bill, Bill, Bill" in hopes of hastening the appearance of the man who made employee stock options a national currency.

Gates' arrival is followed by a moment of homage during which photographers rush to the foot of the stage while affluent spectators, comfortably settled on the far side of middle age, applaud wildly, fire salvos of flashcubes and joyfully salute the world's richest man with the illuminated faces of their cell phones and PalmPilots.

"Ninety-nine percent of the great Internet applications have yet to be written," Gates says once the frenzy abates. "Consumers will see immediate benefits from our ability to tear down the walls that prevent people from using information in a really meaningful way."

To clarify exactly what he means, Gates introduces designer Ralph Lauren's son David, who explains how he

Comdex-goers from around the world ponder choices among competing attractions in the daily program and newspaper.

used Microsoft software to create a Website (www.polo.com) that helps the fashion challenged select attire for business trips and learn how to prevent cashmere from pilling. "With our 'Ask Ralph' feature we've gone beyond the flat screen to create what I call 'merchantainment,'" he beams. "Now it's possible to not only buy clothes but also book a spa vacation at the same time."

Can Microsoft save the world? Gates clearly thinks so. For the next hour he enthusiastically continues to introduce new software products and business partners he deems essential to the ascent of man. If some of the digerati leave Gates' presentation early, it's only because they need their rest. Over the next five days each will, on average, walk 21 miles, attend nine hosted cocktail receptions, collect dozens of business cards and amass close to 50 pounds of promotional literature.

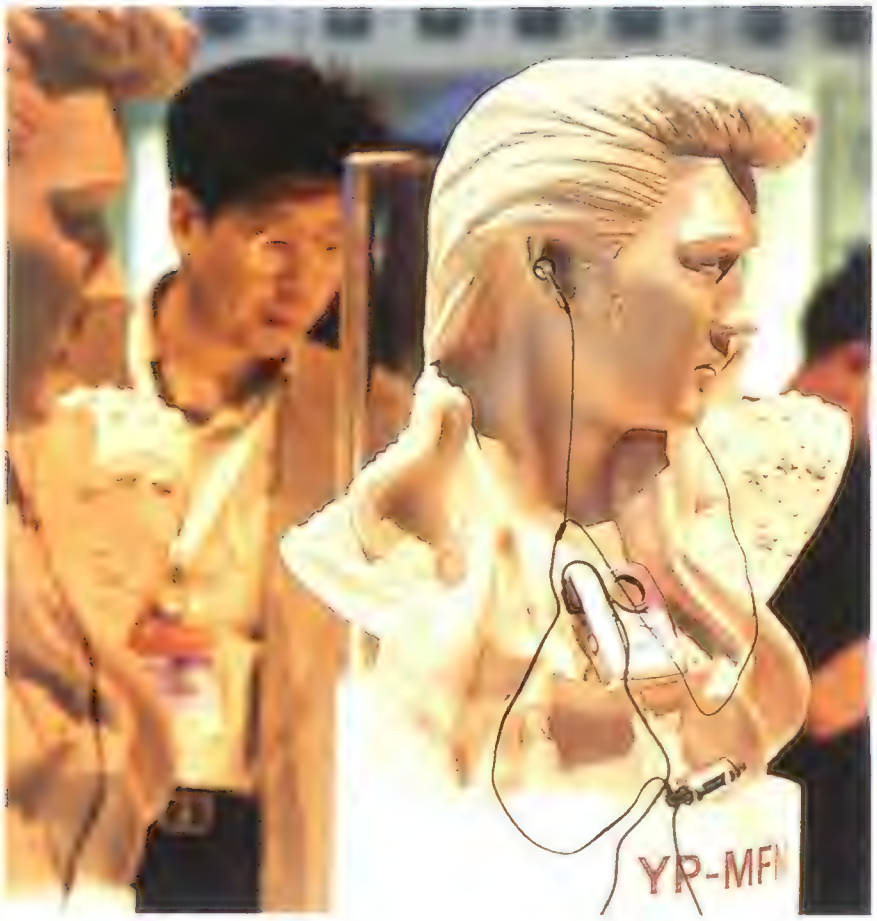
**Day One, 10 A.M.** Comdex opens, and immediately thousands of corporate executives, electronics manufacturers and computer resellers begin flowing into three huge convention halls. Officially, they come to evaluate some of the 10,000 new products being offered by the show's 2,000 exhibitors. But for the industry's cognoscenti, Comdex is a boisterous geekathon where "early adopters" of the latest Internet technology can revel at the leading edge of the electronic zeitgeist.

Surging down carpeted aisles sprayed three hours before to minimize static electricity, the crowd separates into smaller streams as it meets booths strategically positioned with crowd control and emergency evacuation in mind. Some people head to the "Biometropolis" area, where computer security companies demonstrate voice and visual authentication systems; others opt for the "E-Mobility HotSpot," where wireless telecoms cluster.

Moment by moment the crowd builds, its sound increasing to a steady thrum, as people wander between exhibits, attracted by technical lectures, merchandise giveaways or pert young marketing managers offering to demonstrate the latest wireless device or computer peripheral. Employees working the booths may seem relaxed, but there is tremendous pressure on them to spread the corporate message.

The cost of exhibiting at Comdex is enormous. At $55 per square foot, space on the convention floor exceeds the rate charged by many Manhattan office towers. When this basic expense is added to the cost of building the exhibit and transporting, housing, feeding and entertaining a sales staff, even a modest booth can cost more than $1 million. At Comdex 2000, Microsoft paid $2.5 million for floor space alone. Additional expenses brought the total cost of its presence to more than $12 million.

Since every person passing by a booth is a potential cus



Companies showcase new products to draw crowds at Comdex. Clockwise from top: A visitor plays with Sony's "Aibo," or "Companion," a robotic pet that displays emotions and learns as it responds to its "master"; Olympus' eyeglasslike video viewers give two wearers big-screen images; a showgoer uses a stylus to interact with Aqcess Technologies' tablet-format computing device; a bust of Elvis displays a Samsung MP3 digital music player.

tomer, corporations use ingenious methods to attract attention. With a prosaic product line of memory cards, CD jewel boxes and optical storage devices, CMC Magnetics of Dublin, California, realized it would have difficulty attracting people to its display. So last November it hired two unicyclists to juggle the compact discs it manufactures. Hitachi brought people into its booth with a near-hallucinatory display in which commercials for 26 products were played simultaneously on enormous plasma video screens arrayed in a circle. Microsoft employs a more subtle approach. It lays a thick pile carpet throughout its exhibit to slow pedestrian traffic. Then it invites weary attendees loaded with product literature and promotional tchotchkes to rest on comfortable chairs positioned in front of software demonstrations.

Those without unicycles or plush carpet often draw a crowd with dancers, singers or carnival performers. At the most recent Comdex, Olympus advertised its digital cameras and recorders while teenage bungee jumpers and dancers bounced about the stage and four pole climbers dressed like Spider-Man sang, "Whatever you do, wherever you go. Olympus expands the limits of the possible."

**Day One, Noon.** It's lunchtime in Las Vegas, but Jose Astudillo has no time to eat. A foot soldier in a small army of caterers, he's been trundling coffee, soft drinks, prune Danish and bagels to hospitality suites and the Comdex pressroom since early this morning. Now it's time to switch to salads and submarine sandwiches. "I work from this list," he explains, producing a computer printout that specifies down to the last herbal tea bag and nutty fudge brownie what is to be brought and at what hour. "There always seems to be just enough."

Comdex mission control is located in a tent outside the Las Vegas Convention Center. From here Comdex general manager Bill Sell ensures the steady flow of coffee and cookies to the pressroom. He also operates a fleet of 125 buses that shuttle attendees between the various venues, edits the *Comdex Daily*, a 104-page newspaper distributed each morning during the show, and supervises Comdex TV, an advertorial loop of tech profiles and stories that plays around-the-clock in the city's leading hotels. "I also try to give 100 press interviews over the course of the show, but right now my big concern is the wind," he confides. "*Forbes* is having problems keeping its hot air balloon tethered. We may have to ground the *Capitalist Tool*."

Trade shows—events that match buyers and sellers in an environment conducive to commerce—have been around for centuries. In America their production has become a major industry that annually generates $12 billion in sales: each year trade shows attract more than 125 million people. In a city like Las Vegas, whose merchants earn at least $255 million each time Comdex comes to town, they are a driving force in the local economy. But the impact of trade shows extends far beyond resort cities. Indeed, trade shows and conventions have become so pervasive that their attendees now account for 25 percent of all U.S. hotel room nights, according to *Tradeshow Week* magazine.

The most profitable trade shows are those that showcase information technology. Typical profit margins for the larger ones are around 30 to 40 percent and can climb even higher. One of the most profitable shows is Comdex, which in an SEC filing last year reported earnings of $90.3 million on revenues of $251 million. Sixty percent of Comdex revenues come from exhibition fees. Companies are encouraged to reserve space at least a year in advance, and when they do, a 20 percent down payment is required—with the balance falling due six months before the show begins. No other business enjoys this kind of cash flow. Comdex and several other leading IT (information technology) trade show companies can pay some of their expenses with interest earned from money deposited earlier in the year.

Manufacturers of Internet appliances who are desperate for attention willingly pay top dollar to companies that can display their products in a festive environment that draws media attention. Comdex certainly has no problem attracting reporters. The 3,600 journalists that showed up in Las Vegas last November exceeded the number that attended the Super Bowl. One reason industry analysts go in large numbers is the rapid pace of innovation in the $300 billion IT industry. "Thirty years ago a computer had a shelf life of seven years," Patrick McGovern, founder and chairman of International Data Group, has said. IDG produces Linuxworld Conference & Expo, Macworld, and the Internet Commerce Expo. "Today, hardware is obsolete after seven months, and software has seven weeks before a newer product hits the market."

An additional reason for the show's popularity is that in an industry known for impenetrable manuals and indifferent customer service, Comdex is the one week of the year in which it's possible to speak with technical people who can provide a patient, hands-on demonstration of how their products actually work.

"Large Internet and information technology companies typically spend about 20 percent of their marketing budget on trade shows because they provide a successful promotional platform," says Michael Hughes, *Tradeshow Week*'s director of research. "Bill Gates' keynote is the world's most closely monitored business presentation. That's why a company like Intel will wait until Comdex to introduce products such as the newest chip."

Opera Software's Pal Hvistendahl, of Oslo, Norway, ducks Comdex's high-priced exhibit space, hosting customers in a limo.

**Day One, 3 P.M.** After five hours on the convention floor, it's good to get outside. The sun is shining brightly, so I follow a group of XML programmers across Paradise Road to a parking lot where Mercedes Benz has set up a miniature test track. It's not exactly the open road, but there are enough S curves to give a driver a feel for the cars. And, besides, they're giving away free T-shirts.

When I ask what Mercedes is doing at a trade show for computer geeks, I'm directed to Chuck Johnsen, an executive from Chicago, who is so pleased with the way things are going that he's giving away Mercedes baseball caps too. "It's a great marketing opportunity," he smiles. "You can feel the aspiration here. These up-and-coming young executives may not be S Class yet, but they certainly can afford a sporty $30,000 C Class car."

So what's become of the sallow nerds who used to live off Cheetos and Diet Pepsi and thought foosball was really neat? They're still at Comdex, except now they have expensive haircuts, tailored slacks and trophy wives named Tiffany. Sales executives swoon when presented with the personal demographics of a Comdex attendee. Ninety percent are male and half of them are computer experts aged 35 to 49 earning more than $75,000 a year.

Twenty-one years ago, when the average Comdex attendee still owned a pocket protector, Comdex truly was a "Computer Dealers Exposition." Today, the grand old names of computer manufacturing have much lower profiles. Apple no longer exhibits at Comdex. Dell has moved off the convention floor, and IBM's corporate presence barely registers as a blip. Their places have been taken by companies like National Semiconductor, which sells components for Internet appliances.

National Semiconductor has a marketing challenge, however, since most of the items it produces end up tucked away inside Internet devices with different brand names. That's why it spent $1 million on an exhibit featuring a song and dance team that delivered the message that PCs are passé. "Can you tell me what the Internet appliance revolution will do away with?" the performers ask after ten minutes of coaching. To a response from the audience: "That's right, the PC. Give that man a T-shirt."

There's lots of talk about how much companies are spending, and why—most of it guesstimating and speculation. Figures for Cisco range from $2 million to $5 million. Some say Dell isn't on the exhibit floor because it had a less-than-exciting earnings report; others argue that Dell is just thinking cost-benefit.

At Comdex, bigger not only is better, it's a barometer of business success. But Comdex is becoming so expensive that even successful companies—like Dell Computer—are retreating from the show floor to hotel meeting rooms and other less expensive venues.

Eschewing a Comdex booth, Dell sales representatives hold court at a Las Vegas-styled home rented for the occasion.

**Day One, 6 P.M.** Getting a cab in Las Vegas is not difficult. Except during Comdex when demand far exceeds supply. But even then it's easy to move around courtesy of companies promoting their products on a tight budget. The problem comes when two drivers approach at the same time and you're forced to chose between a Hummer and a stretch Lincoln. I select the latter, and in return for my business card, Opera Software communications manager Pal Hvistendahl hands me a beer and starts giving me information about his Internet browser. "I had to come to Comdex, but my company in Oslo, Norway, doesn't have money for exhibit space," Hvistendahl explains. "But this limousine only costs $4,000 and lets me make a more personal presentation."

After a journey of less than two miles, Hvistendahl drops me off in front of a modest house close to the Interstate. Inside is Michael Dell, who along with his mother is holding court next to a tub of guacamole. "Of course I'm at Comdex," he explains with a wave. "We're number one in the U.S., so I have to be here. I just thought this would be a more intimate setting than the trade show floor to meet the press."

Furnished with lava lamps, weird spark generators, and chairs upholstered with faux zebra pelts, the house is a home only Austin Powers could love. But Dell is not deterred by his surroundings. "We'll be giving a party for 500 customers at the Bellagio later this week," he says. "We're trying to limit our spending to groups that are important to us."

**Day Two, Morning.** It is easy to see why Comdex is the most profitable trade show in the world. Everything is for sale. Want your corporate logo on the side of a building or the top of a taxicab, or embossed on a thousand tote bags? For a fee Comdex will get it there. Need a blimp or an electric marquee? No problem. Trying to impress prospective clients staying at a different hotel? Comdex will publish an upbeat story about your company in its daily newspaper, then place a copy of the paper in front of your clients' room doors. If additional exposure is required, Comdex will get your corporate message printed on magnetic hotel key cards.

One of the best ways to increase brand-name recognition is with a Comdex TV infomercial that plays 24/7 in every Las Vegas hotel where show attendees are booked. But what if an exhibiting company's local television station lacks the money to send a correspondent to Comdex? Not to worry. Comdex TV will send a daily story to your station via satellite uplink and allow the local stand-up reporter to take credit.

A company eager to spread the word that it has arrived in the world of big-time event marketing could pay Mc

Carran Airport for permission to put up posters. Or it could emulate McAfee.com and let Comdex drape the MGM Grand Hotel with a 27,000-square-foot sign large enough to be seen by every plane landing at the airport.

"We're always trying to push the envelope, but sometimes we go too far," admits Michael Goodman, Comdex's executive vice president for event marketing. "There was some negative feedback when we used hotel voice mail to deliver advertising messages." Pushed for examples of event marketing proposals Comdex rejected, Goodman came up with one: "We said no to Gateway Computers when it asked to turn the foyer of the Las Vegas Convention Center into a cow pasture."

**Day Two, Afternoon.** Most trade shows employ buxom women in thong bikinis to hand out corporate literature. At Comdex, corporate shills are more likely to impersonate Albert Einstein or disguise themselves as serial-port connectors. There is no scholarly reticence, however, when it comes to parties. Once the sun goes down at Comdex, corporate receptions can feature everything from Klingon fortune-tellers and armadillo races to magic shows and toga parties.

Several years ago, Symantec, a Northern California software designer, hired the Las Vegas Mini Grand Prix, dressed its employees as crash test dummies, then stuffed well-lubed vendors into zooming go-carts to tout a new program designed to prevent computers from crashing.

As recently as four years ago, the nighttime social scene still bore some resemblance to the attendees' proletarian past. After U.S. Robotics tempted gourmands with tables loaded with burgers, nachos and Dove Bars, Microsoft countered with a keg and pizza "Geekfest" held at an all-night wedding chapel. But newly minted millionaires began selling nostalgia short when the NASDAQ began its phenomenal climb in the late 1990s. Now Microsoft holds its parties at the House of Blues, and when Bill Gates made a midnight dance appearance at the annual E-Week party, the venue was Las Vegas' Studio 54, and many of the people on the dance floor wore pearls or $5,000 suits.

This year's hottest party was given by white-shirt-and-tie-straight EDS, a Plano, Texas, IT strategy and service firm. To counter that image, it rented an airport hangar, painted the interior ice white, brought in white sectional sofas for lounging and hired singer Macy Gray and the rock band Barenaked Ladies to entertain. The ultramod fashion look developed for impossibly hip hotel bars—and its attendant "We don't mind if you spill the Cabernet" statement—put an exclamation point to the company's corporate makeover and underscored the fact that business entertaining at Comdex is not about having a good time but

**Visitors line up to register, look up exhibitors and browse for new products at rows of computer terminals in Comdex's main hall.**

has everything to do with marketing a corporate brand.

Indeed, at the recent Las Vegas Comdex, EDS was everywhere. As part of a marketing effort estimated to cost around $8 million, it hung huge banners on buildings, designed a laser-beam-studded 9,900-square-foot exhibit and built a "cat herders corral" in the convention center lobby to reinforce the message in its TV commercials that designing business solutions in a digital economy is as difficult as herding cats.

"Longhorns and buffaloes still may graze near EDS' Plano headquarters," says Robert Priest-Heck, COO of the events division of the Key3Media Group, the company that runs Comdex, "but after this week, it no longer will be regarded as Ross Perot's company. EDS now is a hip new leader for the digital age."

**Day Two, Evening.** "Don't forget to screw in the scuzzy port. And remember, there won't be a winner until the Windows jingle sounds."

With instructions out of the way, the small group of technical writers bends to the task at hand: assembling 30 computers that will be given to needy schools courtesy of Systemax, a Port Washington, New York, hardware manufacturer. Some are logy after several trips to the open bar

*"When I first heard the words 'breast cancer,' it seemed like the end of the world... five years later, I feel life is just beginning."*

— Oni Faida Lampley

This is Oni Faida Lampley, one of two million breast cancer survivors living in the United States. Thanks to early detection and effective medicines, today, the five-year survival rate for women with early-stage tumors is an incredible 97 percent. At America's pharmaceutical companies, we're always working to discover new medicines to fight the disease. Now we have 59 new breast cancer treatments in development. We've come a long way in the fight against breast cancer. But we won't stop till it's beaten. www.newmedicines.org

**AMERICA'S PHARMACEUTICAL COMPANIES**

NEW MEDICINES. NEW HOPE.

Exhibitors compete for customers with ever more spectacular displays. Here, bungee-bouncers and dancers drag 'em in for Olympus.

and a buffet loaded with boiled shrimp, satay and what appears to be lobster. But *Houston Chronicle* columnist Dwight Silverman has his eye on the prize. Armed with the knowledge that computers are basically boxes of air filled with silicon chips stuck onto a board (and experience from two previous attempts to win the computer-building race), Silverman sets to work, and five minutes and 45 seconds later the bootup crescendo of the Windows OS blares forth. Silverman smiles, happy in the knowledge that a school will profit from his prowess, and that he's just as competent as the nerds in the corner nibbling crab-filled mushroom caps.

"This is my fifth Comdex," Silverman admits once the applause abates. "I could do all my interviews by phone, but here I meet staffers who will show me things I otherwise would never see."

**Day Three, Afternoon.** Comdex may be capitalism in its purest form. But away from the convention, briefly removed from the high tide of marketing, it is possible to actually experience a contemplative moment. Las Vegas Comdex sponsors hundreds of tutorials, and 6,500 people attend—some paying up to $2,795 for the privilege—to listen to an impressive array of forums and symposia on emerging wireless technologies, the new e-culture, and ways to integrate data, voice and video. Perhaps even more valuable than the information gained is the opportunity to meet and exchange business cards with the 450 industry leaders who serve as presenters.

What is the future of information technology now that computer sales are falling and the NASDAQ has had palpitations? I decided to look for the answer at an "Extreme Knowledge Supersession" subtitled "Technology Reality in Your Future." The forum featured three science fiction writers, one of whom began by observing that nobody can predict the future, but it is possible for Silicon Valley engineers to invent it. One of his more skeptical colleagues quibbled that if computer geeks were so smart, they should be able to write programs in real languages. "Comdex is old technology," he sniffed. "The real wonders of technology are the protein molecules that run us."

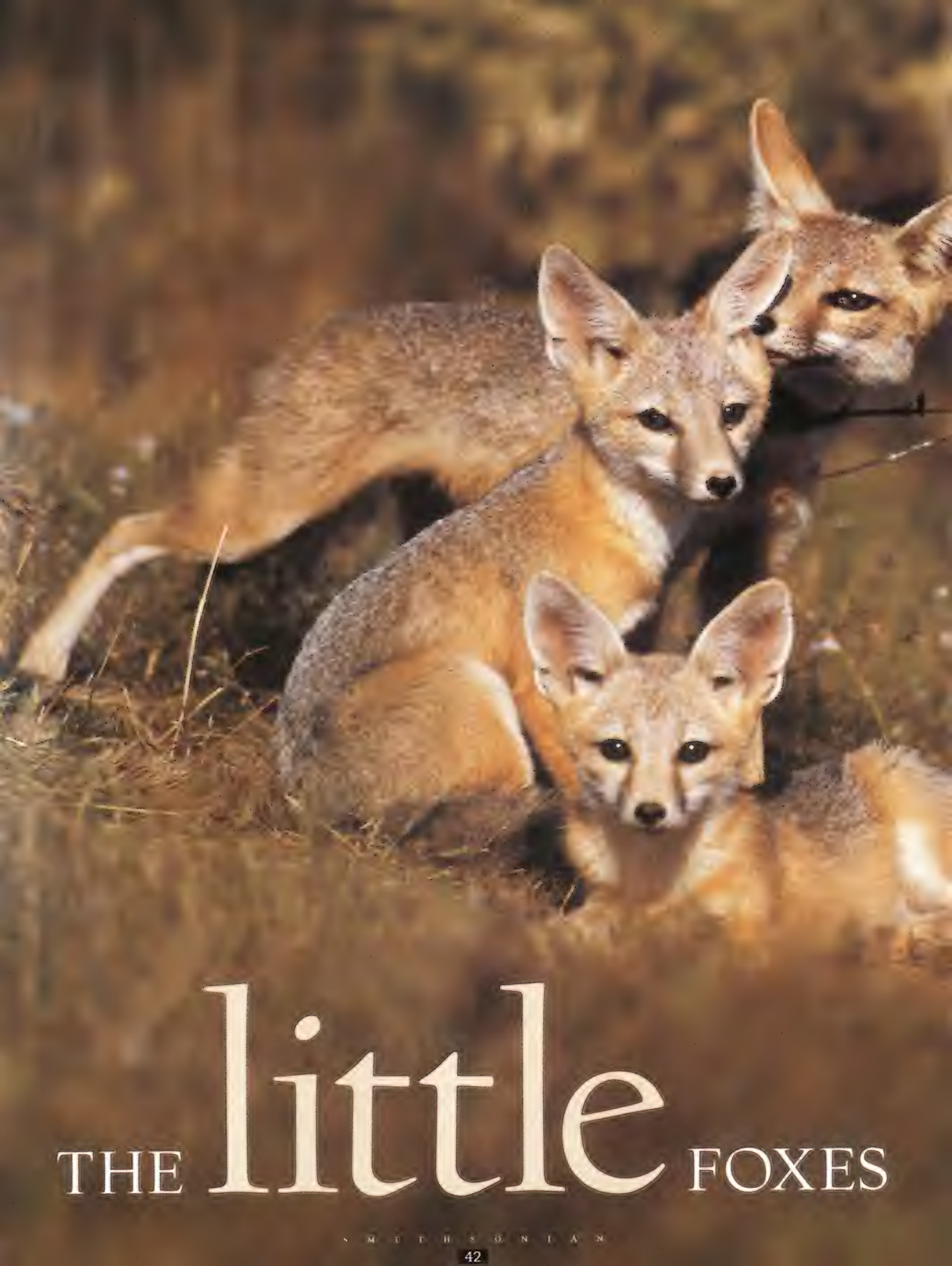
Silently, the audience fidgeted in the dark, wondering, I suppose, where this was heading. Then Larry Niven, coauthor of *Lucifer's Hammer*, distilled the future in a way all of us could understand. "Remember in high school it was always the jocks against the nerds? I've walked around Comdex, and I wouldn't bet on the jocks anymore."

*David DeVoss' last article for* SMITHSONIAN, *"Looking for Gavrilo Princip," appeared in August 2000. He is the editor of East-West News Service. Eric Sander's photographs appeared in "Cruise to Alaska," in the June 2001 issue. Both are based in Los Angeles.*

# When winters get down to -30°F, you'd better have someone whose passion burns bright.

*Rosemary Turner, District Manager, Northern Plains—North Dakota, South Dakota, and Nebraska*

Actually, sometimes it gets down to -40° F, but who's counting? You see, temperature is inconsequential to Rosemary. Whether there's five feet of snow on the ground or blistering sunshine, Rosemary is still responsible for on-time delivery to a 225,000-square-mile territory. Of course, covering a lot of ground is nothing new for her. She's been climbing the UPS career ladder ever since she started as a part-time customer service representative in California. It just goes to show you, at UPS we're always looking for the people whose fire burns brightest. Of course, in this instance, that's the only way to tolerate the winters. To learn more, visit www.community.ups.com



# THE little FOXES

BY ADELE CONOVER

CHAMPAGNE-BLOND IN THE FAILING LIGHT, seven tiny animals engage in what looks like a game of touch football. Their big-eared parents, five-pound San Joaquin kit foxes, mark the playground's boundaries with an occasional sharp woof. I could be anywhere in the 8.5-million-acre San Joaquin Valley a century or so ago.

Reality intervenes. I am standing in a nondescript field, and that dark "cliff" in the background is an insurance company. I am in Bakersfield, California, in early April. This family of 9, along with 200 or so fellow San Joaquin kit foxes, shares this town with some 250,000 humans supported by Big Oil, Big Agriculture and sundry service

THEIR HABITAT IS DISAPPEARING FAST, BUT SAN JOAQUIN KIT FOXES ARE FINDING WAYS TO SURVIVE

In California's protected Carrizo Plain, an adult kit fox keeps an eye out for both prey and predator.

industries. The human population is growing by 3,000 to 5,000 annually, notes biologist Brian Cypher, who studies this unique urban subtribe for the San Joaquin Valley Endangered Species Recovery Program (ESRP).

Although Cypher's tribe is safe for the moment, in order to ensure its long-term survival, he seeks the secret to its success. His data is being matched by the research of Katherine Ralls, a scientist with the Smithsonian's Conservation and Research Center, on a wilder kit fox population living just west of here, in the Carrizo Plain National Monument. The combined information will reveal much about genetics, behavior, distribution and population size that can be applied to the little carnivore's conservation. One of several subspecies of kit fox, and the only one that is listed federally as endangered, the San Joaquin kit fox is considered an umbrella species for this part of California: if it survives, then other threatened and endangered animals and plants that share its habitat will too.

Ralls and Cypher are part of a new breed of biologists who advocate research applicable to endangered species. "It isn't enough just to publish in a scientific journal to help endangered species," says Ralls. She prefaced one article, "On Becoming a Conservation Biologist," by paraphrasing a Jewish proverb to stress her point. "If not us, who?" she wrote. "If not now, when?"

Scientists estimate that the range-wide population of the San Joaquin kit fox prior to 1930 was 8,000 to 12,000; in 1975, about 7,000. The current population is unknown. Three "core" and several satellite populations exist in California, but they are widely separated.

The San Joaquin kit fox came to such dire straits—less than 5 percent of its original habitat remains—as a result of the usual suspects: agriculture, development, oil exploration and, more so in earlier days, "varmint control" poisoning and trapping.

In Bakersfield, says Cypher, the attitude toward the kit foxes is mixed. "Some are afraid of them. Some no doubt would like to shoot them. Some regard them as 'their' kit foxes, and if they see us trapping to put on ear tags and change [radio collar] batteries, they want us to stop."

Now, in a bow to the tiny fox's rare status, the city keeps a map of the known dens that may harbor kit foxes, says Cypher. In the early 1980s, however, the city's first conservation plan did not even mention the little foxes despite their 1967 federal endangered listing. "Kern County is not always endangered species-friendly," says Cypher. "Negotiations took more

STEPHEN J. KRASEMANN/DRK PHOTO; PP. 42, 43 B: MOOSE PETERSON

than seven years until the Metropolitan Bakersfield Habitat Conservation Plan was approved in 1994."

Officially, no one paid much attention to urban kit foxes in Bakersfield until 1985, when Cal State biology professor Ted Murphy approached the Bakersfield city council about 440 acres of riverbed and floodplain that he hoped could be set aside to create a riparian studies area, in part as a way to protect the kit foxes that lived there. "The agenda item before mine was someone proposing a golf course on the very same property," remembers Murphy. "Needless to say, the council found that proposal more tempting." At least one council member ultimately sided with Murphy, as did the Sierra Club, the Audubon Society and others, and eventually, the golf course developers lost. Murphy later used nine radio-collared kit foxes to document the peril that vehicles, expanding development, predators such as domestic dogs and even rodent poisons continued to pose for kit foxes in the city.

Now Cypher's study has investigated 220 dens in town. "Eighty-four percent were dug in dirt, 12 percent in structures created by human activity, and 4 percent in open fields that have so far escaped development," he says. Humans are everywhere. But the little foxes have two speeds, fast and faster, and sometimes they can avoid trouble with urban predators by squeezing into openings no larger than four inches across. The little foxes dig make-do dens under storage areas, and in school yards, storm-water drainage sumps, concrete rubble piles and pipes. Recently a radio-collared kit fox snuggled into a pipe in a rack. Unfortunately, the rack of pipes was loaded on a truck, and the fox was on its way to Los Angeles, about 100 miles away. The pipes were unloaded and warehoused before anyone realized that one was already spoken for. After a *Night at the Opera* scene in which the truckers tried to trap the little settler, a colleague of Cypher's recaptured the fox and returned it to Bakersfield.

"Still, their urban life is a bonus," says Cypher. "Storm-water storage sumps are proving to be good habitat, and every time a new housing division comes along, builders (or the city) have to put in a new sump—so unknowingly, developers are actually creating kit fox habitat."

Moose Peterson, a photographer and student of the San Joaquin kit fox for more than 15 years, sits with me, hidden in a clump of shortish tamarisk trees across from a sandy slope. We are inside the walled enclosure around the sump proper. The sump environs—with its storm-water drain in the center—is sunk about ten feet down in the middle of a housing development. The enclosure is bounded by a locked chain-link fence faced with redwood slats. We can only see the development's red roofs from here. A mother kit fox is sunning herself in front of one of many entries to her den, dug into the sandy bank that walls the sump. A very small pup emerges briefly and looks around. As kit foxes are nocturnal animals, I can't believe my luck. "This isn't so bad," I say to Peterson, who looks at me and snorts, "Yeah, considering we are sitting in a sewer."

A 4-day-old pup, born in captivity, snuggles up against its mother.

For the moment, this little family is safe here—neither feral nor domestic dogs have breached the fence. A cat might slither in, but "they ignore each other," says Cypher, "although feral cats may use [empty] kit fox dens. But then so does everyone else: badgers, coyotes, red fox, burrowing owls . . . and vice versa."

For the most part, in the "real" world kit foxes escape their predators and the high temperatures of their desert environment by spending the day underground in a den. In Bakersfield, they follow suit. Kit foxes move every couple of weeks to a new den. Moving to different dens may be one reason why they have persisted—the constantly changing abodes provide new places to hide.

Bakersfield's kit foxes—like all carnivores—are opportunistic. In spite of the 1985 controversy, these little canids are not entirely opposed to golf courses. Many a kit fox has been seen trotting across the green with a golf ball in its mouth, which it later caches. Researchers wonder if they think they're eggs. Or are these toys for the pups?

One Bakersfield golf course, while not exactly prime habitat, became very attractive to a pair because of the food—supplied by local residents whose homes abut the course. Dave Houghton, a retired electrical technician who lives by the course, became taken with the pair and its litter, and even defended their territory—rearranging a fox den that a "big yellow dog" destroyed. The den is not more than ten yards from his back patio swing. From this front-row perch, Houghton has witnessed two males

MICHAEL DICK/ANIMALS ANIMALS

The dark slash on the left side of this hole in the ground along a busy suburban street in Bakersfield, California, is the entrance to a kit fox den.

fighting in his driveway over the territory—"the older guy with the radio collar lost," he says—and watched pups charge each other in myriad mock battles. "It's a wonderful show," says Houghton.

"We have no control over who feeds the foxes," says Cypher, "and they'll eat just about anything." Says Christine Van Horn Job, Cypher's field biologist: "If you are just looking at the wrappers, it seems they are aficionados of fast food, but you'll also find remnants of mourning dove, gopher heads, ground squirrels and gopher snakes."

We are headed to the "field," bumping around Bakersfield in a big tan truck, radio-tracking equipment at the ready to visit five family groups that Van Horn Job keeps under surveillance in an area less than one square mile. We zero in on the back side of a Cal State maintenance area. Our first stop is at a sump. From above we can just see the dens. Two 3-month-old pups come out and explore briefly. A huge white plastic bucket-top waves around in the wind, and either it or we startle the pups because they zip back into their hole. Their mother sits in the sun just on the edge of a den. She looks a little haggard, and not just because she has a flopped left ear. Van Horn Job suggests that the pups have worn her out. In the background, ravens call, cars go by and, in the adjacent athletic field, baseball practice continues. "Night games—despite all the lights—don't even faze them," says Van Horn Job.

When mom and dad let the pups first come out, at 4 weeks or so, they are about seven inches long, are wobbly on their feet, and have a snub nose. "They don't even look like kit foxes," Van Horn Job says. By 2 months, they look like miniature editions of the parents.

As we head farther afield, we visit another den, but there's no action. All we find are some French fries passed over by both fox and human. Soon, however, Van Horn Job picks up a fox's signal. We head for the north side of the same insurance company near where I first saw the touch football game. We creep around the insurance company parking lot. Van Horn Job has her antennas out. The radio bleeps. We get strange looks from a few passersby.

"This is part of the turf of the flop-eared female's mate. He's really comfortable around people," says Van Horn Job. The radio is bleeping like mad, at a frequency particular to that male's collar transmitter: he must be here somewhere. "These are his favorite napping places," she adds, as she points to the parking places for

the handicapped and the space marked for the employee of the month. There is a Dumpster right here and food from lunching employees; it's also not at all busy during work hours. If the kit fox who is napping here is the father of seven I met earlier, no wonder. The foraging is great, and so, probably, is the peace and quiet.

"Uh-oh, here comes security," says Van Horn Job as a uniformed person bristling with antennas and radios approaches. Van Horn Job smiles beatifically and waves at the security guard. Promptly we wheel out of there. "We've gotten approval from the company, but I don't recognize this guy. And sometimes it's just too hard to explain," she says.

The next day I head for the Carrizo Plain National Monument, 45 or so miles away, to where Kathy Ralls' study is centered. It is the little toe of the Central Valley's footprint. Cooperatively managed by the U.S. Bureau of Land Management (BLM), the California Department of Fish and Game, and The Nature Conservancy, the bulk of the Carrizo Plain has been protected since the mid-1980s.

It is grassland habitat, a teardrop-shaped area grading to the Temblor Range on the east and the Caliente Range in the west. The Carrizo has little water—only mountain springs and Soda Lake. The lake's surface may be five miles by one mile during the rainy winter, but in summer the lake dries out—its parched bed revealing the salty, crystalline residue of its briny waters.

Mammoths and prehistoric hunters once passed through here. Later residents, the Chumash Indians, a once large and widespread tribe, were subdued when Spanish cattlemen arrived in the plain in the 1700s, followed by Anglo-Americans in the 1800s. The place became, and long remained, a vast pasture for cattle, horses and sheep. To some extent cattle ranching continues within the periphery of the reserve—although much reduced. "The cattle are used as a management tool," says Johna Hurl, BLM's resource manager for the plain. "They are only allowed to graze at certain seasons, to keep the exotic grasses from setting seed and to otherwise manage the vegetation to support endemic and endangered species." In the 1980s, The Nature Conservancy (TNC) began buying property in the nearly untouched Carrizo Plain, and selling it to the Bureau of Land Management, as they created a protected area that became known as the Carrizo Plain Natural Area. Before leaving office in January 2001, President Clinton signed a proclamation declaring the area a national monument.

Golf balls, a tennis ball, a baseball and an old paintbrush become toys for kit fox pups.

When I first arrived on the plain with Kathy Ralls in early April, the valley was awash with rain. That precluded any exploration because the roads become impassable. There are apocryphal tales of people and their cars being swallowed up in wet clay substrate. The local motel displayed a sign: "Closed until further notice."

By June, the landscape is dry and baking; gone are the rainy season grasses of April. Flying over the Carrizo Plain during the day with Bob Stafford, a California Fish and Game biologist, the place almost looks populated. Thousands of bare spots several meters square remind me of the housing developments that dominate Bakersfield. These are the work of kangaroo rats, which mow down the vegetation surrounding their burrows, harvest the seeds, stack them in the sun to dry, defend their drying piles of seeds against San Joaquin antelope squirrels, horned larks and other seed predators, and finally store the harvest underground for future use. The plain is crisscrossed by the paths of countless travelers—kit fox, coyote, and the returning fauna of 100 years ago, tule elk and pronghorn antelope (reinstated in the 1980s), as well as the BLM's research cattle.

From the air the San Andreas fault is a crooked slash running through a valley below the Temblor Range. The biologists are taking a census of pronghorn fawns. Pilot and warden Gary Schales swoops down for a closer look, and we weave back and forth over running antelope, counting. The herds sometimes run under the power lines, which precludes flying over them. We make a sharp turn. I grit my teeth. There is a cat's cradle of fencing crisscrossing everywhere. "The fencing is just one of the problems to overcome," says Stafford. "It has to be removed. Now the pronghorn just whip under them if they can." At least two golden eagle pairs have nested here. Bobcats roam the plains; black bears, mountain lions and black-tailed deer live in the western mountains. California condors have been spotted drifting over the

The foxes frequently visit the Bakersfield maintenance yard, where they know there's a good chance of a handout from city employees.

area. The Carrizo is a last slice of a much earlier California.

Ralls is a native Californian and, as a result, became determined to turn her skills to the conservation of the biodiversity of California. At about the time the Carrizo Plain Natural Area project got under way in the late 1980s, TNC funded Ralls to study the impact of coyotes on San Joaquin kit foxes. It turned out to be considerable, says Ralls. "They seem to have a turf mentality. The coyotes occasionally kill kit foxes, but they don't appear to be killing them for food, because they rarely eat the whole fox. The two are in competition for the same smaller prey—so they may be trying to occasionally scare the kit foxes away." However, says Ralls, the little foxes have a more dangerous enemy—the non-native red fox. "They are harder on them than the coyotes are." But the red foxes have enemies of their own—those same coyotes, who may perceive these larger foxes as more of a threat and thus be more eager to attack them. In the end, the coyotes may be doing the kit fox a favor by keeping the red fox numbers down in the Carrizo.

Predation is the main cause of the kit fox's [illegible] percent annual mortality rate. But there are other factors—such as food. If there's a drought one year, plants don't produce seeds, and kangaroo rats, even though they have packed away stores for that year, run out of food the next year and don't reproduce. As their populations, as well as that of other rodents, drop, so too do populations of kit foxes, who with little to eat also don't reproduce. During a five year drought in the late '80s and early '90s, kit foxes were declining both on the Carrizo and in the Elk Hills Naval Petroleum Reserve, about 25 miles southwest of Bakersfield, where Cypher studied kit foxes on oil extraction lands for eight years. Too much water is also a problem. When heavy rains break a drought—although it might turn the parched Carrizo into a festival of wildflowers—it can flood out kangaroo rats and rot their stores.

Kit foxes can have big litters—four to seven pups—born in February. No one knows what goes on before they emerge from the den. But there's no mistaking a pupping den later. Hurl of the BLM recalls "carnage: halves of squirrels, discarded snakes. I've seen them play tug-of-war with dead gopher snakes."

Ralls notes, "As they grow older they enter into a sort of adolescent phase—when they're almost full-size, but they don't yet know how to hunt. Kit foxes are solitary hunters, but these youngsters tend to move around together in groups. They're less likely to catch anything than to alert every kangaroo rat and beetle in the district that they're coming."

The megafauna numbers may be thinner, but nature is still red in tooth and claw here in this miniature Serengeti. Dan Williams, ESRF founder and kangaroo rat expert, was working on a pilot study to test the effica

cy of reintroducing kangaroo rats into a vacant area on the plain. He says, "We watched a kit fox sneak up, wait like a cat by a kangaroo rat's many holes and then pounce. A few kit foxes got so they followed us around while we were doing our study. K-rats would become disoriented when we tagged them, and occasionally kit foxes would grab them." In the mid-1990s Williams and his colleagues ran into trouble with a few kit foxes that had learned to open the rectangular traps used to capture the kangaroo rats. "That had never happened before," comments ESRP director Patrick Kelly. "We eventually had to make wire enclosures around our traps to prevent these very smart kit foxes from getting 'box' lunches."

Kit foxes also relish blunt-nosed leopard lizards and the San Joaquin pocket mouse. San Joaquin antelope squirrels, California ground squirrels, cottontails, grasshopper mice, deer mice, wood rats, pocket gophers, mourning doves, snakes, grasshoppers, beetles, Jerusalem crickets, all come under their purview. They'll even pursue the occasional jackrabbit.

Hurl saw a kit fox chasing a jackrabbit at full speed one night. "The three to five pound fox got a firm hold on the neck of the bigger jackrabbit, which just kept running with the little fox attached."

Kit foxes, unlike wolves and other canids, do not hunt in packs, but neither are they loners, as some biologists originally thought, says Ralls. When Ralls started her study, she expected to confirm that kit foxes, like other small canids, are monogamous and that the young would disperse from the parental home range after they were grown. But she is discovering that kit foxes have a complex social life. At the very least they are into the kit fox equivalent of family solidarity. Ralls' work reveals that parents maintain relationships with their grown offspring and that daughters often move into mom and dad's adjacent territory. Daughter kit foxes have even been detected bringing their new mate over, as if to meet the family.

According to Ralls' studies, in the process of finding a mate, some foxes engage in a kind of courting behavior. "Before breeding season, an unrelated male may live for a time in an unattached female's den. They may stick together, or the male may just move on." There is also evidence of attached males associating with some females who are not their "wives." "They are generally quite monogamous," says Ralls, "but there may be a little fooling around on the side."

Ralls did not get this Kit Fox Confidential scoop by skulking around kit fox dens wearing dark glasses and wielding a telephoto lens. She and her assistants gathered data by monitoring radio-collared kit foxes—and have begun to sort out these complex relationships through the magic of DNA. They hope to find out even more through paternity testing.

"Unfortunately, we don't have the full story. There isn't enough money to do a full-scale dispersal study, comparing radio-tracking estimates of behavior and survival all year round," says Ralls. (Like many wildlife projects, Ralls' runs on a shoestring.) "We don't know for sure how many kit foxes are here on the plain or, for that matter, anywhere else," she says.

One of the least high-tech ways of studying wildlife in the old days was collecting scat to deconstruct what an animal had for dinner. But scat has another dimension: it contains DNA. Best of all, collecting scat is noninvasive, says Ralls, and potentially gives the same information as invasive methods such as radio collaring.

Next to DNA, an endangered species biologist's best friend may turn out to be a dog. Ralls enlisted Rio, a grave and dignified German shepherd; his owner, Debbie Smith, a PhD student at the University of Washington; and Megan Parker and Aimee Hurt, a PhD student and undergraduate, respectively, at the University of Montana. Smith, Parker and Hurt train dogs to detect specific species' scat in the field and ignore everything else. Needless to say, this can be tricky.

It's hot even in early morning on the plain as I go out for a training run

**Ted Murphy, a researcher and advocate for the foxes, holds the remains of one buried alive in its den by construction equipment.**

Using dogs to find kit fox scat are, left to right, researcher Katherine Ralls and trainers Megan Parker, Debbie Smith and Aimee Hurt.

with Rio, Smith and Parker, on Rio's first day in the new environment. Parker has set up a course of somewhat aged kit fox scat imported from Bakersfield. In his working harness, Rio starts out eagerly but misses the first time. "It has to be a game," explains Smith, so there are no recriminations. Next time Rio is like a pilot on a mission. He waits and waits, and when the signal comes he is focused. Then, ignoring all else—even some coyote scat—Rio finds it. Lavish praise for Rio. His reward is a large rubber toy proffered only on these occasions. Rio and Smith play tug-of-war with the toy, and Rio gets to win.

In a few days, researcher Jesús Maldonado, at the Smithsonian's molecular genetics lab at the National Zoo, will start to get numerous special delivery packets filled with carefully labeled scat from which he'll extract DNA. (It later turned out that of the 329 scat samples from which Maldonado was able to extract DNA, all were kit fox scat. Rio had been 100 percent accurate.) To decrease the possibility of picking up DNA from something the fox ate, Maldonado says, "I have to shave off a sliver of scat to get sloughed-off kit fox intestinal cells and match them against a 'library' of other samples. We then compare that with the census data for population counts. We'll eventually be able to establish paternity, family groups, related and unrelated individuals." These methods will be particularly useful in figuring out the genetic relationships among kit foxes and estimating where they are and how they use the habitat. All, including the Bakersfield group, are in danger of genetic isolation as well as crushing habitat loss. "We've already learned a lot through our cumulative research," says Ralls. "But there's still a lot more to find out if this species is to make it."

My last night on the Carrizo I go spotlighting. Our light captures a galloping badger, then pairs of the golden eyes of coyotes, bouncing like fireflies. No glimpse of the blazing blue shine of a kit fox's eyes, but I see one of the critters running in the glare like a starlet from pursuing paparazzi. I am impressed.

But then wild kit foxes have always made an impression on humans. A clay effigy of what seems to be a kit fox was discovered in Danger Cave near the Utah–Nevada border. According to radiocarbon dating, the cave was occupied by humans as early as 9000 B.C. No one knows how long the kit foxes of the San Joaquin Valley have tickled the human imagination, but it likely goes as far back as the days of Danger Cave. It would be a shame to break that chain.

*Adele Conover has written recently on sloth bears, saker falcons, teaching cranes to migrate and mussels that fish for their food.*

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# DUELING BANNERS

## PROVERBS IN THE ASAFO FLAGS OF GHANA

FLAGS HAVE ALWAYS BEEN IMPORTANT IN MILITARY affairs, and this is certainly true in Ghana, where flags carry messages of pride and defiance. The Fante people of the south-central portion of what is now Ghana were among the first West Africans to be exposed to European military forces and merchant traders. In 1471 Portuguese explorers arrived on the Gold Coast, and they were soon followed by a host of traders, including the Dutch, the English and the French. For a time, the Fante formed alliances with these Europeans to combat their traditional enemy, the Ashanti. Seeing the naval banners and regimental

## "If you shoot at a leopard and do not kill it, it is better not to have shot at all."

Animal imagery is common in asafo flags. Opposite: The leopard, a powerful predator, is used as a warrior company's emblem in this early banner and is depicted trampling an adversary.

## "Only a brave man will go under a big tree."

This company may be boasting of its forays into enemy territory. The posture and position of the appliquéd leopard and lion illustrate the influence of European heraldry on Fante flag composition.

## "The monkey leaps only as far as it can reach."

By using this proverb, No. 7 Company could be comparing its rivals to children. Similar to "Don't bite off more than you can chew," this proverb is used to rebuke disobedient youngsters, and it may serve to warn military opponents to avoid attempting what is beyond their reach.

P. 52-P. 53 (BOTTOM) PETER ADLER GALLERY, LONDON; ALL OTHERS: JOHN TSANTES

colors displayed by the Europeans, the Fante created their own flags, to be carried by their warrior companies, or *asafo*. (Once in charge of state defense, these companies are now primarily social and civic in nature.) Artisans combined the form of European flags with their own West African tradition of using proverbs to convey information, creating the innovative and colorful art form seen here.

The cultures of coastal Ghana boast a repertoire of more than 3,000 proverbs, but only about 200 of these are depicted on flags. Each asafo company uses certain identifying colors and illustrations on its flags. Imagery may include historical themes, such as a past conflict with a rival company, or an emblem that identifies the company with a symbol of power, like a leopard or an airplane. These distinctive banners are an integral part of civil ceremonies and celebrations. As Mattiebelle Gittinger, a curator with the Textile Museum in Washington, D.C., notes, "Flags are displayed at 'path clearing ceremonies,' which are homecoming festivals when new captains are named. They are also used at funerals of members of the company, when a new chief is empowered, and on national and local holidays."

The textiles usually measure 3 feet by 5 feet, are made of cotton or silk, and feature appliquéd mirror images on each side. The emblem in the canton (the top inner quarter) helps to date the flags: variations of the British Union Jack appeared until Ghana's independence in 1957, when the Ghanaian tricolor replaced the colonial symbol.

Many of the flags pictured here, as well as several others, are on display at the Textile Museum through August 12, 2001. —*Rebecca Maksel*

**"Like the brebia vine, we can conquer any problem."**

Pointing to the invincible vine, warriors boast that their asafo can overcome any obstacle. The chief's chair is the main symbol of authority in Fante culture.

**"If our women are prepared for war, what will our men do?"**

Military affairs are generally handled by men; images of armed women indicate that enemy troops can expect unusually heavy opposition from the men.

## "When an elephant steps on a trap, no more trap."

This unit identifies with the elephant, one of the strongest animals in the forest, while the crushed trap is a metaphor for its opponent. This proverb may also warn that any conspiracy against the chief will be thoroughly quashed.

## "We can carry water in a basket using a cactus as a head cushion."

Boasting daring and prowess by illustrating this unique use of the spiny plant, the company sends a warning to its rivals that it can accomplish the impossible. The ability to overcome fierce opposition is a popular theme in asafo art.

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Stuart's "Lansdowne" portrait of George Washington, an American treasure long on loan to the National Portrait Gallery, will have a permanent home there thanks to a generous gift.

# THE PAINTER & THE PRESIDENT

## *GILBERT STUART AND THE CREATION OF AN ICON*

◆ BY STANLEY MEISLER

# GILBERT STUART,

THE FOREMOST AMERICAN PORTRAIT PAINTER OF HIS DAY, WAS A THOUGHTFUL AND HIGHLY gifted artist. He managed to infuse his portraits of his most famous sitter, George Washington, with a dignity and presence that inspired Americans 200 years ago and still awe us today. But Stuart was a complex man. He was a garrulous boaster who exaggerated often and sometimes lied. Washington was said to have found his chatter tiresome. Stuart was an impulsive prankster, an incorrigible punster and an excessive imbiber and snuff sniffer. His enthusiasm for a painting often waned as he worked on it, and he was forced by occasional spells of depression not to work at all. Yet none of these faults detracted from the genius and talent to create what Stuart scholar Dorinda Evans calls "a metaphysical incandescence" in his portraits, as if, as some contemporaries reflected, he were depicting the souls as well as the features of his sitters.

Stuart's unique traits attracted renewed attention earlier this year as a result of the campaign by the Smithsonian's National Portrait Gallery to hold on to the life-size painting of Washington by Stuart known as the Lansdowne portrait. The portrait had been on loan to the gallery for more than 30 years, but its British owner notified museum officials last fall that he planned to sell it in 2001.

Fearful that this banner of Americana would end up elsewhere, even outside the United States, Marc Pachter, the gallery's director, crisscrossed the country and took to television in a call for help. The Donald W. Reynolds Foundation of Las Vegas answered the call and generously agreed to donate the $20 million needed to purchase the painting. The portrait will stay.

The outcry over the possible loss of the Lansdowne portrait drew attention to a special problem. There was so great a demand for paintings of famous personages in the late 18th century that painters would often turn out several versions of the same portrait—an original and replicas of the original. But Stuart left so few records and offered so many tangled tales about his paintings that it is difficult now to determine which are the originals.

Until relatively recently, a version of the Lansdowne that belongs to the Pennsylvania Academy of the Fine Arts in Philadelphia was regarded by many art historians and curators as the original. But most Stuart scholars now agree that the Smithsonian's portrait is the original and the Academy's a replica.

Stuart was a few days short of his 39th birthday in late 1794 when he arrived in Philadelphia, the nation's capital, intent on painting portraits of President Washington. He had by then already amassed a colorful record of brilliant achievement.

Stuart overcame periods of dire poverty on his way to the top. He grew up in Newport, Rhode Island; his father manufactured and sold snuff. Stuart wanted to paint, and an itinerant Scottish portrait painter, Cosmo Alexander, took him on as a teenage assistant. After touring some of the Southern colonies, the two left for Scotland. Soon after their arrival, Alexander died, and Stuart was left with little money and too few patrons to support himself as a painter. He managed, however, to work his way back across the Atlantic on a collier.

When revolutionary fervor began to sweep the colonies, his father, a Tory loyal to King George III, left for farmland that he owned in Nova Scotia. Stuart did not share his father's sentiments. During a discussion with a friend about the king, Stuart, according to the friend, said, "Hang the King, what is he to us? He lives too far off to do us any good. . . . " But the aspiring young artist did decide to seek his fortune in London, and set sail in 1775.

Stuart fared poorly in London initially. He painted a few portraits, earned a bit as a church organist and endured bouts of hunger. Finally, out of desperation, he wrote a letter to Benjamin West, the best-known American painter in London. "I've just ar-

**An intense Gilbert Stuart (inset) peers from the shadows of this self-portrait, painted when he was about 23. A few years later, his first full-length portrait, *The Skater (Portrait of William Grant)*, opposite, with its unusual skating motif, was a hit at the 1782 Royal Academy exhibition.**

REDWOOD LIBRARY AND ATHENAEUM, NEWPORT, RI; PP. 58, 59 NATIONAL PORTRAIT GALLERY, SI. P. 61 NATIONAL GALLERY OF ART, WASHINGTON, DC ANDREW W. MELLON COLLECTION

rived at the age of twenty-one," he wrote, ". . . and find myself ignorant, without business or friends, without the necessities of life. . . . Destitute of the means of acquiring knowledge, my hopes from home blasted, and incapable of returning thither, pitching headlong into misery, I have this only hope . . . to live and learn without being a burden." West, known for his kindness to young American painters, looked at Stuart's work and hired him as an assistant.

Stuart did so well in West's studio that in five years he was able to move out on his own. Benjamin Franklin received a letter from a grandson reporting in 1784 that "West & everybody" regarded Stuart as "the first portrait painter now living. . . . " He was so "astonishing for likenesses," the letter writer went on, "I heard West say, 'that he *nails* the face to the canvass.'" A London critic hailed Stuart as the "Vandyck of the Time."

The young painter had attracted early attention with a full-length portrait in which he posed William Grant, a Scottish gentleman, ice-skating on a river. Stuart liked to say that he had painted the portrait only after showing off his own prowess as a skater to Grant. The work, now known as *The Skater*, hangs in the National Gallery of Art in Washington.

During his years in Britain, Stuart also completed portraits of the painters Benjamin West and Joshua Reynolds and the actors John Philip Kemble and Sarah Siddons. He painted a dark self-portrait as well, modeled in part after a 17th-century self-portrait by Peter Paul Rubens.

As money poured in, the once-impoverished Stuart demonstrated a penchant for profligate spending, mostly on lavish clothes and extravagant parties. His taste for the high life was so well known that one Dr. Coates, a Berkshire apothecary, refused at first to let Stuart marry his daughter. Dr. Coates relented, however, and the 30-

Martha Washington commissioned Stuart to paint the companion images of herself and her husband now known as the Athenaeum portraits. Stuart was pleased with his wide-jawed rendering of the first President and would use it as the model for many replicas. The Lansdowne portrait was based on this likeness.

year-old Stuart married 18-year-old Charlotte Coates in 1786. The following year, Stuart and his bride escaped his London creditors by fleeing to Ireland.

His habits did not change in Dublin. Bailiffs pursued him to pay his debts. Stuart boasted that it cost him more to bribe these "vultures" than it would have cost to settle what he owed. The law finally caught up with him, and he was jailed in Marshalsea Prison in 1789 for debt. Enough clients trekked to the prison to have their portraits painted, however, for Stuart to earn his release.

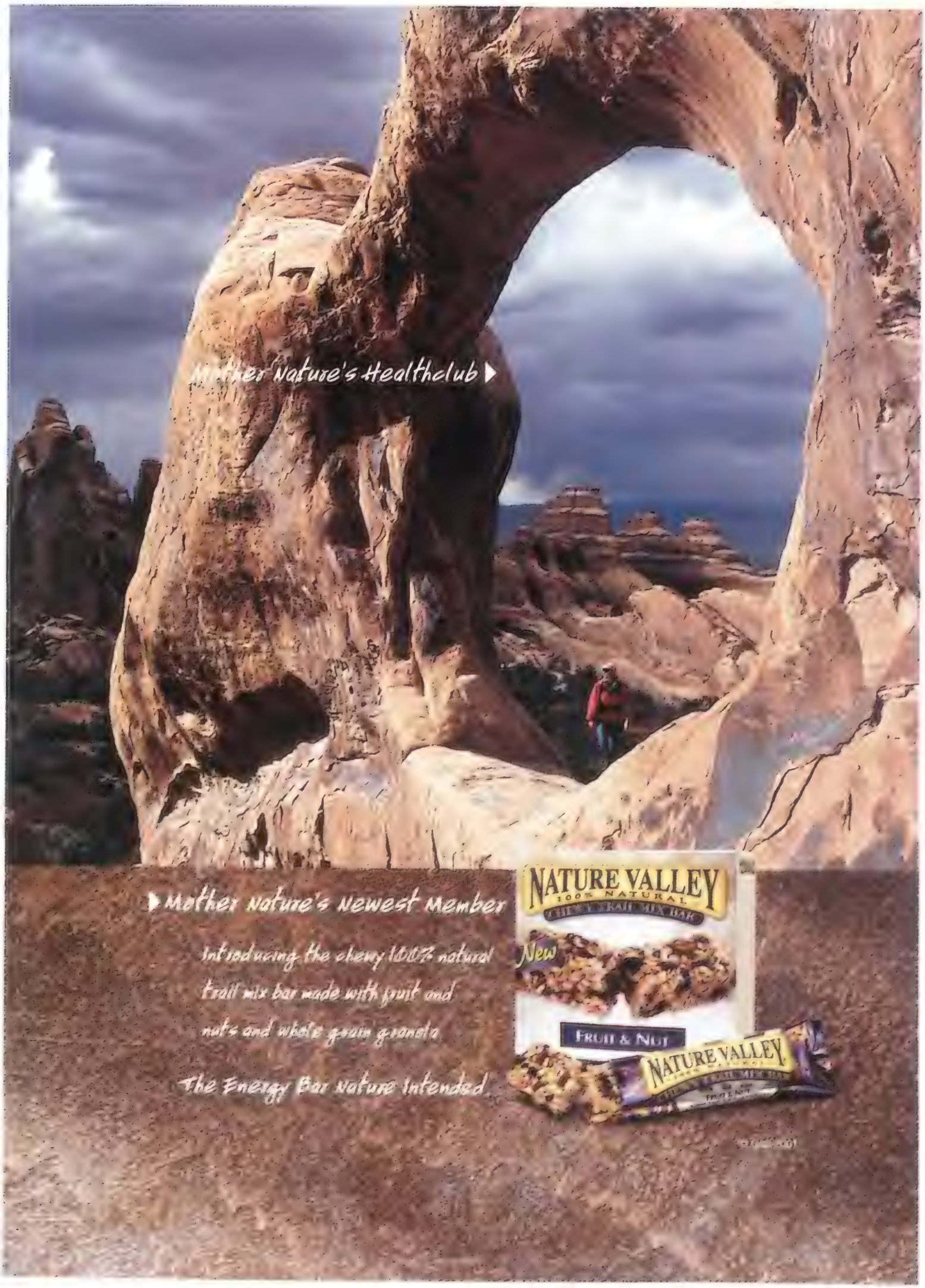
While in Ireland, Stuart decided that the time had come to return to America and paint portraits of the first President of the United States. The elevation of the heroic Revolutionary War general George Washington to the Presidency of the newly independent country had struck the imagination of people everywhere, and admirers in America and England wanted his portrait. Stuart told a friend, "I expect to make a fortune by Washington."

To ease his return, Stuart accepted the standard 50 percent down payments from clients in Dublin, but then painted them for one sitting only, left their portraits unfinished and used the money to satisfy his creditors. He justified the swindle by predicting that "the artists of Dublin will get employed in finishing" the portraits.

Stuart and his family arrived in the United States in 1793. He had been away almost 20 years. Before going on to Philadelphia, he spent more than a year painting portraits in New York. Chief Justice John Jay, who had sat for Stuart while visiting London after serving as a negotiator for the treaty ending the Revolutionary War, commissioned another portrait from him. Stuart also painted such prominent subjects as Aaron Burr and John Jacob Astor. But the most striking portrait of that period was probably that of Mrs. Richard Yates, the plain, thin wife of a New York merchant (p. 64). It is hard to keep your eyes off this wise, strong-willed, austere woman as she sews with grace and dexterity while shrewdly observing all activity before her.

Stuart called on the President in Philadelphia sometime in late 1794 with a letter of introduction from Chief Justice Jay. The 63-year-old Washington, midway in his second term, agreed to a portrait, and Stuart began painting him in early 1795. The artist was challenged by the demeanor of

NATIONAL PORTRAIT GALLERY, S.I., OWNED JOINTLY WITH MUSEUM OF FINE ARTS, BOSTON (2)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the tall, regal general and President, who had grown weary of the demands of portrait painters. Washington seemed apathetic. "A vacuity spread over his countenance most appalling to paint," Stuart is said to have complained. The painter tried to animate Washington with talk about military battles and ancient Rome, but failed.

Two of Stuart's rivals, Charles Willson Peale and his son Rembrandt Peale, also painted Washington in 1795. The elder Peale had fought alongside Washington during the war and completed more than 50 portraits of him in the 1770s and '80s. Two other sons and a brother came to sketch Washington one day while he was sitting for Charles and Rembrandt. Stuart wandered into the room and found five Peales in all. This prompted one of his famous puns. "I found the general surrounded by the whole family," he told a friend. "They were peeling him, sir."

Upon leaving the house that day, Stuart met Martha Washington. "Madam," he told her, "the general's in a perilous situation." "How, sir?" she asked. "He is beset, madam," he replied. "No less than five upon him at once; one aims at his eye—another at his nose—another is busy with his hair—his mouth is attacked by a fourth—and the fifth has him by the button; in short, madam, there are five painters at him, and you who know how much he has suffered when only attended by one, can judge of the horrors of his situation."

Stuart painted three different portraits of Washington from life, all imbuing the President with power and authority and serenity. While working on the first, a bust-length representation of Washington facing toward our right, Stuart apparently felt dissatisfied by what he had painted during the sittings. By his own account, he rubbed out the face and, according to a theory proposed by Dorinda Evans, later repainted it from memory.

At Martha Washington's request, the President joined her for further sittings so that Stuart could paint a pair of companion portraits of the couple. For this commission, Stuart created the well-known image of Washington facing to our left. The artist completed the heads for both portraits but left the rest of the original canvases unfinished.

Despite entreaties from Martha Washington, which intensified after President Washington's death in 1799, Stuart never completed and delivered the original paintings. He clearly wanted to keep them on hand to make it easier to satisfy the incessant demand for replicas. Stuart claimed that Washington had once taken him aside and said that he understood the artist's motives and approved of them. A friend of the Washingtons' wrote, however, "I am sorry to be obliged to observe that the late General and his Lady thought themselves extremely ill used by Mr. Stewart . . . I think Mr. Stewart has not acted honorably. . . . "

Stuart painted more than 60 replicas of this Washington portrait. Whenever he needed cash, he produced one, calling them his "hundred-dollar bills." After his death, his heirs sold the originals to a group that gave them to the Boston Athenaeum. Known as the Athenaeum portraits, they were on loan to the Museum of Fine Arts, Boston until 1980 when the National Portrait Gallery and the Museum of Fine Arts joined to purchase them for $4,875,000. The museums take turns exhibiting the portraits, which are now in Boston.

At the request of Anne Bingham, a socialite and wife of Senator William Bingham, a wealthy Philadelphia merchant, Washington agreed to sit for a third painting in April 1796. The Binghams commissioned Stuart to paint a full-length, life-size portrait as a gift for the marquess of Lansdowne, whom Bingham called "a warm friend to the United States." Lansdowne had resigned from the British Cabinet before the Revolutionary War, as he was thought too soft on the colonies. As prime minister, he later authorized the negotiations that ended the war.

The commission inspired Stuart. The size would enable him to create far more than a likeness: he could paint an image demonstrating the sublime greatness of a truly heroic leader. "It is impossible for any human being to have a more exalted admiration (and I might say love)," Stuart's daughter Jane, also a painter, recalled years later, "than my father had for Washington."

The painting would be the first full-length portrait of Washington in civilian clothes rather than a general's uniform. It is known that he sat for it once. Stuart apparently based the rendering of the head on his Athenaeum portrait, making alterations as he studied Washington in front of him. Someone else posed later for the figure, and Stuart added a symbolic sword. The President is making a sweeping gesture in the portrait, as if addressing Congress. But the scene is a fanciful one, perhaps inspired by an engraving of a French bishop. The portico did not exist. Neither did the table and chair, with their carved eagles, shields and other symbols of the new Republic.

Rivals like the Peales complained that Stuart never actu-

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Stuart's portraits were said to capture the souls as well as the features of his sitters. His incisive depiction of Catherine Brass Yates (Mrs. Richard Yates), 1793/1794 (opposite) is an image of rectitude. Stuart painted Mohawk chief Joseph Brant (above left), who had served as a British military officer during the Revolutionary War, in 1786. The artist altered the pose of Sarah Wentworth Apthorp Morton, a poet, to catch her adjusting a veil.

ally caught the real likeness of Washington, but Stuart was concerned more with the power of Washington's presence than with the measure of his features. "Other paintings probably looked more like Washington," says Ellen Miles, curator of painting and sculpture at the National Portrait Gallery. "Stuart somehow knew how to make Washington look heroic."

Stuart painted two replicas of the life-size portrait immediately afterward: one for Senator Bingham himself (now in the Pennsylvania Academy of the Fine Arts), the other for William Constable, a wealthy, Irish-born merchant in New York (now in the Brooklyn Museum of Art). There has long been a good deal of controversy and confusion over the order in which the three portraits were painted. A fourth version has hung in the White House since 1800, but there is a difference of opinion about whether it is a replica by Stuart or, as Stuart himself claimed, a copy by some other artist.

There should not, perhaps, have been any debate about the chronology of the portraits. In 1823 Stuart, writing on a letter he had received from Washington, certified below the President's signature that the owner of Lord Lansdowne's painting "owns the only original painting I ever made of Washington, except one I own myself [the Athenaeum portrait]. I painted a third but rubbed it out."

But Stuart's reputation for mendacity has become so great that some 20th-century specialists would not accept his certification as evidence. One biographer, Charles Merrill Mount, described Stuart's words as "an extraordinary line of untruths . . . the final triumph of Stuart's many years' devotion to trading in villainy." Putting it more politely, the National Portrait Gallery's director, Marc Pachter, says, "If Stuart himself were not such a complex individual, we wouldn't have such uncertainties."

Following the lead of Charles Henry Hart, an influential art historian a hundred years ago, most 20th-century textbooks and art studies cited the Pennsylvania Academy portrait as the original, in part because it was the only one signed and dated by Stuart and in part because the Smithsonian's Lansdowne was still in England and thus less accessible and less well known. This view started to change in 1974 when a group of conservators and curators, including Dorinda Evans, examined the Smithsonian and Pennsylvania Academy portraits side by

side at the National Portrait Gallery. Four years later, paintings conservators Marion F. Mecklenburg and Justine S. Wimsatt, while studying the condition of the White House portrait, produced a detailed account of the probable chronology of all four paintings. Both studies concluded that the Lansdowne portrait was most likely the original. The painter had worked more fully on it, putting brushstroke upon brushstroke as he tried to model the proper images. He also had altered the painting a good deal, moving Washington's legs sideways, for example. It seems unlikely that Stuart would have changed a stance or experimented with brushstrokes if he were only duplicating a portrait that he had painted earlier.

Further support for the Smithsonian's Lansdowne portrait came two years ago when Princeton University Press published *The Genius of Gilbert Stuart* by Evans, who is an associate professor of art history at Emory University. Based on more than ten years of research, the Evans book, regarded as the leading scholarly work on Stuart, concluded that the Smithsonian's portrait is the original. Evans also reached the conclusion that Stuart's eccentric behavior could have been due to manic depression.

The Lansdowne portrait arrived in London as a gift in late 1796 or early 1797 and delighted the marquess and the critics who saw it. After the marquess's death in 1805, the portrait changed hands several times. One individual won the painting in 1827 after creditors seized it from its bankrupt owner and raffled it off to buyers of £50 tickets.

The fifth earl of Rosebery, a future prime minister, purchased the painting around 1890 for £2,100. A colorful figure who practiced his speeches for Parliament under the watchful gaze of both the Lansdowne portrait and a portrait of Napoleon, Rosebery married the only daughter of the wealthy baron Mayer de Rothschild, wrote biographies of Napoleon and William Pitt, and won the English Derby with his racehorses three times.

The painting returned to the United States on three occasions. It was loaned for the Centennial Exposition in Philadelphia in 1876 and for a Washington, D.C. exhibition in 1932 marking the bicentennial of the birth of George Washington. The Smithsonian in 1967 asked the son of the purchaser, then the earl of Rosebery, to allow the Lansdowne portrait to travel again—for the opening of the new National Portrait Gallery. But he refused.

The Smithsonian, however, had an influential player. S. Dillon Ripley, the ornithologist who was then the Secretary of the Institution, had served with the Office of Strategic Services in India and Ceylon during World War II. Lord Louis Mountbatten was at the time the Supreme Allied Commander of forces in South Asia and Ripley's boss and friend. Years later, when Ripley asked for help, Mountbatten persuaded the Rosebery family to loan the painting to the Portrait Gallery, and eventually the gallery was allowed to borrow the portrait indefinitely.

The painting became a gallery treasure. But ownership of the portrait passed to the current earl of Rosebery's son, Lord Harry Dalmeny, a few years ago. Dalmeny decided he had to sell it in 2001 to bolster family finances.

The British press likes to depict the 33-year-old Dalmeny, who markets country estates for the British auction house Sotheby's, as a young socialite. His loud tobogganing snowsuits, according to the *Sunday Times* of London, "earn him regular appearances in society gossip columns." Though he anticipated criticism for selling the portrait, Dalmeny told the *Times*, "I can't worry about that." Talking with a reporter from the *Washington Post*, he said, "I'm aware that it's a very large sum of money. But I do have to manage the transfer of the picture with responsibility for my family's interests."

**Chief Justice John Jay (above left), whom Stuart painted for the second time in 1794, provided the artist with an introduction to George Washington. Stuart would go on to portray the first six U.S. Presidents, including (opposite) James Monroe, Thomas Jefferson and John Adams.**

NATIONAL GALLERY OF ART

Sotheby's, assigned to sell the portrait, was faced with the difficult task of determining its value. "What makes the Gilbert Stuart portrait complex," says David Redden of the New York office of Sotheby's, "is so much of its value comes from its iconic importance." They could not simply set a price based on the value of Gilbert Stuart paintings. Instead, the portrait, according to Redden, had to be treated as belonging to "the realm of astonishing objects."

Sotheby's estimated that the portrait would probably sell for somewhere between $20 million and $30 million at auction. Dalmeny agreed to sell the painting directly to the National Portrait Gallery if it could come up with the minimum estimate of $20 million by April 1, 2001. Smithsonian officials and gallery director Marc Pachter agreed that $20 million was a fair price, but it was more than 50 times his annual budget for acquisitions. Pachter thus embarked on his nationwide hunt for donors. "I don't think there's a more important single historical painting in America," he told host Matt Lauer on NBC's *Today* show.

"I never believed for a second," Pachter now says, "that this painting would not be bought for the nation." But he also acknowledges, "I had nightmares of a sort." His anxieties were relieved when officers of the Reynolds Foundation, after seeing Pachter on *Today*, offered to provide the funds for the portrait's purchase. The charitable foundation was created by Donald W. Reynolds, who owned numerous newspapers and television stations and left most of his fortune to the foundation when he died in 1993.

Even before the Reynolds Foundation came forward, Pachter says, he was impressed by the outpouring of support from Americans who offered to donate small sums. The response was evidence of "a moment of refreshed patriotism" that reflected "our ability to think of heroes again."

Americans need not rush to Washington to see the portrait, for it will come to them. The National Portrait Gallery closed its exhibition spaces in January 2000 to allow the Old Patent Office Building, which houses it, to undergo four years of extensive renovation. The Lansdowne portrait, on view until September 4 as part of "The American Presidency" exhibition at the National Museum of American History, will go on a national tour sponsored by an additional grant of up to $6 million from the Donald W. Reynolds Foundation. The foundation also decided to donate $4 million to display the portrait in the renovated building. The reopening of the National Portrait Gallery will coincide with another Gilbert Stuart event. The gallery will join New York's Metropolitan Museum of Art in mounting a retrospective of Stuart's work in 2004-2005.

After completing the Lansdowne portraits of Washington, Stuart continued painting for another quarter of a century, dying in 1828 at the age of 72. He had become the painter of Presidents, producing portraits of a succession of the Presidents who followed Washington: John Adams, Thomas Jefferson, James Madison, James Monroe and John Quincy Adams. And in his paintings of lesser-known models, like his unfinished portrait of Sarah Wentworth Apthorp Morton, a socialite and writer of verse, Stuart sometimes achieved a poetic beauty.

He was hailed as a master in those last years, but he still irritated friends and clients with his bouts of depression and wild sprees of spending. More light will be shed by the intensified interest that is sure to accompany the future grand retrospective of the lifework of this great painter. ♜

*Frequent contributor Stanley Meisler has written recently on William Merritt Chase (February 2001) and Art Nouveau (October 2000).*

Bernhardt pulled out all the melodramatic stops in her role as Adrienne Lecouvreur, an actress who poisons herself for the love of a Polish aristocrat.

Bewitching her admirers around the world, Sarah Bernhardt dazzled audiences as she pioneered the cult of celebrity ◆ BY JOSEPH A. HARRISS

# The Divine Sarah

During a 62-year career, Bernhardt applied her protean talents to some 70 roles in more than 125 productions, including portrayals of characters as various as, from left, the title role in *Leah;* the Byzantine Empress Théodora; Hamlet; Zoraya, a Moorish gypsy in

IT WAS THE KIND OF SURREAL MOB SCENE NEW YORK RESERVES for showbiz celebs, with frenzied fans gathered at the stage door for a glimpse of the famous foreign star. When she finally appeared, late, after 29 curtain calls, they went wild. Everyone was shouting to her, reaching for her. One wild-eyed woman tore a gold brooch from her own coat and nearly knocked her down pinning it on her; another tried to snip a lock of her hair but ended up slicing an ostrich plume from her hat. (After another performance, men thrust out their arms and noisily begged her to autograph their cuffs.) A hysterical girl brandished an autograph book, then realized her pen was out of ink; she plunged her teeth into her own wrist and dipped the instrument in her blood. With the mob out of hand, the frightened star beat a retreat back to the theater. She tore off her hat, veil and chinchilla cloak, put them on her sister and sent her out to impersonate her while she slipped out by another door.

It could have been yesterday's rock star event. But it was 1880 and the star was Sarah Bernhardt, The Divine, The Eighth Wonder of the World, and the most celebrated woman of the Victorian era besides—and maybe including—Queen Victoria herself. Arguably the first international entertainment icon, The Bernhardt, as Americans called her, personified stardom carried to mythical proportions; when *Variety* ran a story on the 100 top stars of the 20th century, she was lionized as "the first superstar-diva."

*Despite her modest origins, Sarah wasn't very impressed by emperors and their ilk.*

It is difficult today to imagine the spell she cast over admirers as various as Sigmund Freud, who purportedly kept a photograph of her in his waiting room, and philosopher William James, who called her "the most racehorsey, high-mettled human being I've ever seen." Mark Twain observed there were five kinds of actresses: bad, fair, good, great—"and then there is Sarah Bernhardt."

Her myth traveled throughout the pre-cinema, pre-television world via paintings, photographs, posters and newspaper stories. One biographer calculates that if pasted end to end, the articles about her during her 62-year career from 1861 to 1923 would stretch around the earth, while a pile of her printed photographs would reach the top of the Eiffel Tower. She promoted that myth with panache, eccentric behavior and in-your-face attitude. She made sure everyone knew that she slept in a coffin. And when a reporter exclaimed during an interview, "Why, New York didn't give Dom Pedro of Brazil such an ovation!" she purred, "Yes, but he was only an emperor."

Despite her modest origins, Madame Sarah wasn't very impressed by emperors and their ilk. Many had been at her feet—and even closer. Britain's Prince of Wales was a very dear friend indeed, and her only child was fathered by Belgian Prince Henri de Ligne. Europe's crowned heads visited her backstage, and she gave command performances in their palaces. Austrian Emperor Franz Joseph placed an antique cameo necklace around her neck, while Archduke Friedrich insisted she stay at one of his palaces while in Vienna. Italy's King Umberto gave her an ex-

*La Sorcière*; St. Theresa of Avila, the legendary 16th-century mystic; and *Izéil*, in a drama of the same name. The actress's unorthodox interpretation of *Hamlet* invoked passionate reactions: one admirer fought a duel with a journalist who dared criticize her performance.

quisite Venetian fan, Spain's King Alfonso XII, a diamond brooch, France's Emperor Louis-Napoleon, a magnificent pin with the imperial initials in diamonds. In Saint Petersburg, where they ran a red carpet over the snow to the stage door, Czar Alexander III called on her after a command performance at the Winter Palace. As she was making a deep curtsy, he stopped her: "No, Madame," he ordered, "it is I who must bow to you." And so he did before his entire court.

The Divine continues to fascinate. Earlier this year a New York theater presented *The Divine Trilogy of Sarah Bernhardt*, while Connie Clark, an actress based in North Carolina, has performed her one-woman show, *Sarah*, tracing Bernhardt's life and career, at the Lincoln Center, universities and in Europe. Paris paid homage to her last winter with a sumptuous exhibition at the ornate old Bibliothèque Nationale, just a short walk down rue de Richelieu from the Comédie Française theater where she starred and stormed.

The show presented paintings, costumes, playbills and photographs recalling her life, loves and many of the 125 plays she acted in. "She was really the first media star of our era," says Noelle Guibert, director of the Bibliothèque Department of Theater Arts, who was the curator of the show. "She incarnated the fantasies of the Belle Epoque. She was the one everybody admired, the one to whom they attributed the wildest passions, eccentricities and perversions."

Quite a symbolic load to bear for a pathologically skinny girl whom doctors expected to die before 20. Henriette-Rosine Bernard was born on October 23, 1844, in Paris, the illegitimate daughter of a Dutch-Jewish woman of dubious morals from Amsterdam and an unknown, probably French, father. She was an emotionally unstable, sickly child who seemed to run a constant temperature and frequently spat up blood. Doctors diagnosed a wasting disease like tuberculosis and prescribed snail soup for strength.

*At a convent school, her tempestuous, headstrong behavior drove the nuns to distraction.*

Her mother, Julie, a high-flying courtesan, had little time for her. She often left Sarah with a nanny, before sending her to a girls' school in suburban Paris, where she learned to read and write and throw memorable tantrums. After that it was a convent school in Versailles, where her tempestuous, headstrong behavior drove the nuns to distraction. Altogether she received only six years or so of formal education. She tells us in her memoirs, *My Double Life*, an artful mix of fact and mythmaking, that when she was 9 she adopted her spunky lifelong motto, *"Quand même,"* meaning in spite of everything. She had jumped over a wide ditch on a dare, landing painfully on her face and spraining a wrist. "I'll do it again if they dare me," the willful child screamed through tears at her mother and aunt as they doctored her. "And I'll do whatever I want all my life!" Sighed the aunt prophetically, "*Quelle enfant terrible!*"

At 15 she overheard doctors telling her mother that she had only a few years to live. Death became an obsession, and she acquired a pretty coffin so she could get used to it. (The resulting rosewood and satin model became one of the stage props in her life; countless postcard photographs of her reclining dramatically in the flower-strewn casket were sold in Europe and America.) About this time,

too, the influential Duc de Morny, one of Julie's wealthy lovers and Emperor Napoleon III's half brother, advised the family to send the enfant terrible to the Conservatory of Music and Drama in Paris. When Morny got her a box seat at the Comédie Française, France's prestigious national theater, Sarah sobbed uncontrollably at the heroine's plight. That did it: the girl who would become the last of the great Romantic actresses was hooked on the theater.

She threw herself into her lessons at the conservatory, then considered the world's finest drama school, even if she later took the opportunity to mock it in her memoirs. It was solid training, but mostly a bore for Sarah, who always relied on her instincts and raw emotion for effect.

Still, it got her into the august Comédie Française—with a little pull from Morny—at the age of 17. Her first performance on August 11, 1862, was nearly a catastrophe due to a bad case of teeth-chattering stage fright, which would nag her all her life. The critics were indulgent but unimpressed. "Mademoiselle Bernhardt . . . is a tall, attractive young woman with a slender waist and most pleasing face," wrote one. "She carries herself well and pronounces her words with perfect clarity. That is all that can be said for the moment." In any case, the high-strung, rebellious young woman felt uncomfortable among the stuffed shirts of the French theater establishment. Within a year she was fired for slapping a leading lady who had been rude to the younger sister Sarah doted on, Régine.

Out of work except for occasional roles, Sarah turned to her mother's trade to make ends meet. It was a time when "actress" was virtually synonymous with courtesan or kept woman, and the dandies expected their favors as a right. One day, for example, the Prince de Joinville, Emperor Louis-Philippe's son, sent a cryptic note to Rachel, one of France's great leading ladies: "Where? When? How much?" She zinged back a succinct, practiced reply: "Your place. This evening. No charge."

In the early 1860s, when Bernhardt was an aspiring actress, photographer Félix Nadar, chronicler of the Parisian literati, created a dreamy portrait of his subject.

In 1864, after a particularly bad performance in a second-rate play, Sarah took off and ended up eventually in Brussels. There she had an affair with Prince Henri de Ligne, got pregnant and gave birth to a son she named Maurice, whom she would adore and indulge for the rest of her life. If anyone had the bad taste to inquire about his paternity, she would assume a pensive pose and reply evenly that she could never make up her mind whether it was French Prime Minister Léon Gambetta, Victor Hugo or perhaps General Georges Boulanger.

Nearly two years later her slow, erratic acting start took a turn for the better when she joined Paris' Left Bank Théatre de l'Odéon. There she honed what would become her trademark technique: authentic, impassioned acting that she reveled in. Favoring improbable, wholehearted, three-hankie drama, she emerged as the consummate tragedienne, running the emotional gamut of tigerish passion, melting seduction, excruciating loss and unbearable sorrow.

Such technique compensated for being no great beauty. Her hair was hopeless, a frizzy, unruly, reddish blonde mop. She hid her low brow beneath a tumble of curls, which also had the advantage of enlarging her

small eyes. And in a day when the canons of beauty called for opulent, Rubenesque women, she was not only thin, she was skeletal—"A Madonna's head stuck on a broomstick," as the writer Alexandre Dumas *fils* called her. She never needed an umbrella, boulevard wits said, as she was so skinny she could walk between the raindrops.

It was at the Odéon that a star was born on the evening of January 16, 1872, when she played the love-stricken Queen of Spain in Victor Hugo's *Ruy Blas*. Backstage visitors included the Prince of Wales, who stepped aside respectfully when the white-maned, bewhiskered author, by then a French monument, entered, dropped to one knee, kissed Sarah's hand and murmured "*Merci, merci.*" Outside, a cheering crowd filled the streets, while excited students unhitched the horses from her carriage and pulled it themselves, shouting "Make way for our Sarah!"

Shortly thereafter the Comédie Française invited her back. Although she was handed some important roles in the House of Molière, she again chafed under rules that rotated leading parts, operated on strict bureaucratic seniority and permitted no stars—a stifling atmosphere for an actress with her temperament. She threw so many tantrums and slammed so many doors that the theater's exasperated director began referring to her as "Mademoiselle Révolte."

But even French bureaucracy could not prevent Madame Sarah's star quality from shining in another Hugo tragedy, *Hernani*, in which she played a Castilian noblewoman who loves the bandit Hernani and takes poison with him at the end. So moved was Hugo this time that he sent her a box with a note in it next day. "Madame," he wrote, "when the public, touched and enchanted by you, applauded, I wept. This tear that you caused me to shed is yours. I place it at your feet." The tear in question was a single perfect diamond on a gold bracelet.

Hugo loved what he termed her golden voice. Not powerful or deep, it was a highly musical voice that writers vied to describe: "As sonorous as pure crystal," wrote Alphonse Daudet, while Jules Lemaitre called it "a caress that strokes you like fingers, so pure, so tender, so harmonious."

But beyond that, the lady could really act. "Acting is all internal, but must be externalized," she said. Sarah built her characters from the inside out and embraced less stylized, more truthful acting than was generally practiced at the time. As a young woman she could transform herself into an 80-year-old crone, simulating blindness by showing only the whites of her eyes. As a 56-year-old grandmother, she could convincingly play the 20-year-old Duke of Reichstadt, Napoleon's consumptive son, dying in the last act "as angels would die if they were allowed to," said one critic. And in *Joan of Arc*, when the judge demanded her age, she invariably brought the house down when she deliberately turned to face the audience, who knew she was 65, and declared triumphantly, "Nineteen!"

Both her memory and stagecraft were the stuff of legends. She could memorize a part merely by reading it through four times, blocking out her moves as she went: after the fifth reading she had it down pat—and performed without a prompter.

Bernhardt's arrival on any shore created a frenzy: disembarking at Folkstone for a tour in England, she was feted by an admiring entourage.

Studiously cultivating her image, Bernhardt, who had been a sickly child, appropriated an obsession with death as one aspect of her persona. Rumored to sleep in a coffin, she also capitalized on a reputation for brooding intensity, as the image (right) suggests.

When playing Cleopatra, she often used a real snake for the final scene. And she captivated audiences at *La Tosca* with her stage business of placing lit candlesticks around the body of Scarpia and a crucifix on his chest after stabbing him, then slowly backing off in horror, her gown's long train trailing along the stage until the curtain fell. It was her acting that inspired Puccini to compose his opera based on the play.

Inevitably, the time came for her to decide whether to stay in safe repertory at the national theater with its stilted acting style or try an independent career. She resigned from the Comédie Française in 1880, formed her own troupe and headed to London's Gaiety Theater to begin her life as an international star. It was the first stop on foreign tours that would, over the next 40 years, take her throughout Europe, from Britain to Greece and Spain to Russia, and to North and South America.

After London, where rumors were rife—she was said to hold a witches' Sabbath certain nights, smoke cigars in the morning, take boxing lessons, even dress in men's clothes—Sarah sailed for New York for a six-month tour. She landed on October 27, 1880, amid all the fanfare her canny impresario for the tour, Edward Jarrett, could muster with spicy advance publicity, perhaps the first deliberate campaign to create an international star. The public was dying to learn more about The Bernhardt.

*She was said to smoke cigars, take boxing lessons and dress in men's clothes.*

Her first New York performance, *Adrienne Lecouvreur* at Booth's Theater, was declared off-limits to children because it dealt with an unmarried actress's affair with a rakish aristocrat. Despite, or perhaps because of, that, she played to a packed house that broke into roaring applause after Adrienne died in the final scene, and went on for 27 curtain calls. It was at Booth's that same month of November 1880 that she created her signature role, Marguerite Gauthier in *La Dame aux Camélias* by Dumas *fils*, that for the next 43 years she would play more than 3,000 times all over the world. On a later U.S. tour, railway magnate William Henry Vanderbilt attended every one of her New York performances of *Camille*, weeping openly into a large handkerchief. When Sarah returned to France, he gave it to her as a souvenir.

Then it was on to Boston. Proud of its open-minded appreciation of culture, the city welcomed her more warmly than New York. The critics were ecstatic: "Before such perfection, analysis is impossible," wrote one. Sarah returned the feeling. "Boston belongs to women," she declared. "They are in the majority there, they are intelligently puritan, and gracefully independent." The tour comprised 156 appearances in 50 cities and towns from Albany and Pittsburgh to Detroit. After Chicago, she boarded the Sarah Bernhardt Special and rode in her own private Palace Car with walls of inlaid wood, brass gas lamps,

As the doomed Adrienne Lecouvreur, driven mad by the faithlessness of her lover, Bernhardt reveled in one of her signature roles. This caricature of her performance was inscribed with the knowing aside, "Sarah dies all over the place."

Turkish carpeting, lounge area with sofas, piano and potted palms. The dining room table seated ten and was laid with linen and china with her *Quand Même* crest. Two cooks prepared meals. (On another tour, in Louisiana, she bought a small alligator she named Ali-Gaga, which made itself comfortable beneath the bedcovers at night. It finally died, they say, from too much champagne.)

Americans fell in love with Sarah, and vice versa. "I adore this country, where women reign," she said. In at least eight more tours—four billed as "The Farewell Tour of Mme. Sarah Bernhardt"—she crisscrossed the country. She did *Camille* in huge tents in Missouri and Texas, cornstalk stubble tearing the dresses of women spectators. At one Texas stop a cowboy rode up and asked for a seat. None was available until he pulled his six-shooter. Entering the tent he drawled in passing, "By the way, what does this gal do, sing or dance?"

This was an interesting change of pace for "that anxious, strange, morbid being named Sarah Bernhardt"—her own description. At home in her Paris town house on Boulevard Péreire, her furnishings included a skull on her desk and a skeleton named Lazarus, plus the famous coffin in which she often studied her roles and, gossips said, received her lovers. She liked to welcome other visitors dressed in a long white gown and reclining on a cushion-strewn divan on a platform, canopied with

*"I adore this country," she said while visiting America, "where women reign."*

Oriental hangings supported by velvet-covered spears. She kept a menagerie that at various times included her enormous wolfhound Osman, a friendly lynx on a leash, a baby tigress named Minette, and a tame lion, until the beast started smelling too bad. Visitors never knew what to expect. When Alexandre Dumas *fils* called one day to show Sarah a new play he had just written, a pet puma calmly devoured his straw hat.

None of which deterred her devoted admirers, known as *sarahdoteurs*, from flocking to her. Her court, as she called them collectively, ranged from writers like Hugo, Zola, Dumas, Flaubert and Oscar Wilde, who wrote the play *Salome* especially for her, to statesmen like Gambetta, the Prince of Wales and Theodore Roosevelt. She could be very funny, mimicking some of them wickedly, and regaling them with catty remarks. Of an actress who tried to play the male lead she had made her own in *L'Aiglon*, she said, "The poor dear isn't man enough to make us forget she's a woman, and not woman enough to be appealing."

That wasn't her problem. Sarah played some 25 male parts, from Prince Charming to Cyrano de Bergerac, Judas and Hamlet. She liked men's roles, she said, because they were generally more tormented and intellectual than women's.

Certainly she had courage enough for several men. When Army Captain Alfred Dreyfus, who was Jewish, was

Thousands of mourners thronged the streets of Paris to pay their final respects to the legendary actress, who died on March 26, 1923.

unjustly sentenced to Devil's Island in 1894 on trumped-up, anti-Semitic charges of treason, Sarah took his side against most French popular opinion. Though many of her friends and her son, Maurice, stopped talking to her, she helped persuade Emile Zola to write his famous "J'Accuse" article that turned the tide in Dreyfus' favor. And when spreading gangrene struck her right leg in 1915, she pleaded with two doctors to amputate it, threatening to shoot herself in the knee if they refused. (She had endured painful problems with her knee for years.) They declined because she was 71 and suffering from chronic uremia. Finally a surgeon agreed, and she hummed the "Marseillaise" as she was wheeled down the hospital corridor. Later, she tried an artificial leg but found it too cumbersome. Also refusing to use a wheelchair, she opted for a specially designed litter chair in Louis XV-style with gilt carving, and was carried around like a Byzantine princess. She altered her stage business so that actors were gathered around her, seated, and kept on acting. For ovations she stood on one leg, held on to a piece of furniture, and gestured with one arm.

Shortly after the amputation, she visited the WWI front lines near Verdun to perform for French troops in

*When Dreyfus was unjustly sentenced, she helped persuade Zola to write "J'Accuse."*

mess tents, hospital wards, open marketplaces and ramshackle barns. Propped in a shabby armchair, she recited a patriotic piece to war-dazed men fresh from the trenches. When she ended with a rousing "*Aux armes!*" they rose cheering and sobbing.

Despite failing health, Sarah flung herself into silent movies, making eight in her waning years, including her biggest hit, *Queen Elizabeth*. She was shooting a film on location in her town house for an American producer in the spring of 1923 when she collapsed. She died in the arms of Maurice on March 26 at the age of 78. That evening, all Paris theaters observed two minutes of silence. Parisians lined the streets as her funeral procession wound its way to Père Lachaise cemetery, where Molière and admirers Marcel Proust and Oscar Wilde were buried. There she was interred in the rosewood coffin. In contrast to the famous cemetery's ornate tombs with handsome sculptures and long inscriptions, only two words were deemed worthy to decorate the simple granite tomb of The Divine Sarah Bernhardt.

*Joseph A. Harriss, a frequent contributor, is based in Paris.*

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# *Suiting Up for the* Honey Wars

Photographs by Gilles Nicolet

AS ARMOR FOR BATTLE, Danga Yermbany's ill-fitting suit of straw may seem an odd, even ludicrous, choice. But the costume of the 80-some-year-old Gbaya elder, who will face his adversaries perched precariously above the jungle floor of West Africa on a rickety wooden scaffold, will prove quite effective.

Yermbany and several of his friends practice a ritual known as *éé bì ngour-ngour*, or "going into battle," the traditional harvesting of wild honeycombs. Instead of using smoke to pacify the bees, these hunters rely on plant sedatives and straw armor bound with fiber from a raffia palm. The old tradition originates from a time when the Gbaya depended on nutrient-rich honey for their survival and could not light fires for fear that the smoke would reveal their whereabouts to their enemy. Although no longer at war, some members of the Gbaya continue this tradition, disappearing into the forest during the dry season for several weeks. These remarkable images represent the first time this secret practice has ever been photographed.

The Gbaya locate the nests in the thick tangle of riverine forest of Cameroon's Adamawa plateau with the help of the greater honeyguide, a diminutive bird species that has developed a unique symbiotic relationship with humans and a honey-eating badger. Unable to retrieve the honeycombs

A Cameroonian honey hunter prepares to battle a hive of bees 45 feet above the forest floor protected only by a straw suit.

Right: Like knights preparing for battle, Danga Yermbany and Iyawa Samuel don their straw armor, protecting their shoulders from bruising with leaf shoulder pads. Below: Hours earlier, the men built a scaffolding up to the nest and a small balcony directly outside it, working quietly so as not to disturb the bees. Below right: In exchange for a cut of the take, the greater honeyguide led the hunters to the nest with its excited chattering. If the bird does not appear on its own, the hunters summon it by whistling, singing or rhythmically tapping on a tree trunk with their machetes.

by itself, the honeyguide enlists the help of larger predators by leading them to honey-rich nests with its call.

To subdue the bees, Yermbany will deposit a mash of verbena or euphorbia leaves into the nest, then seal the opening with mud. Yermbany mixes the batch of natural sedatives carefully: too much will kill the bees and destroy the colony, too little will endanger the honey hunter. The mixture will give him less than 30 minutes to extract the honeycomb. Even at its most effective, however, the sedative won't knock out all of the bees. French photographer Gilles Nicolet reports that angry bees penetrated his protective, modern gear and stung him on the nose, lips and forehead, and left two stingers in the eye he was using to peer through the shutter of his camera.

Honey hunters must also beware of snakes, which are sometimes found inside bee nests; the deadly green mamba's bite contains a venom so toxic that a bitten hunter can die in minutes. Although Yermbany must endure the pain of many dozen stings, the costs are worthwhile to him: each nest yields 50 pounds of golden honeycombs on average. He always leaves enough comb to ensure the survival of the colony. And Yermbany never forgets to reward the honeyguide with a sweet finder's fee of comb dripping with honey and filled with bee larvae.

—*John F. Ross*

Left: As Yermbany fills his last calabash full of honeycomb, the bees awaken from their drug-induced lethargy and begin to swarm. Before retreating, he will lower the heavily laden bowl down to his helpers with a vine, moving slowly and methodically so as not to anger the bees even more. Above: The hunter's hands, unprotected so he can retrieve the honey, bear the brunt of the hive's anger, and a friend must remove dozens of stingers. Right: The Gbaya honey hunters weave special eyeholes into the helmets of their straw suits.

BY SIMON WINCHESTER

PHOTOGRAPHS BY PETER MCBRIDE

FROM THE MYTHICAL CHARYBDIS TO THE MONSTER MAELSTROM, THESE WATERY GYRES THRILL AND CHILL US

# *in the eye of the* WHIRLPOOL

Tides racing through a narrow passage between two islands create the Saltstraumen, a whirlpool that forms every six hours off the coast of Norway near the town of Bodø.

Many had died in it, the old man said. His own brother was one such, who had drowned in the whirlpool 30 years back.

OF ALL THE MANY PREJUDICES THAT AFFLICT AN AVERAGE ENGLISHMAN, THE one to which I most happily subscribe is the notion that we produce, and long have produced, the finest maps in all the world.

Britain's Ordnance Survey, a body first established to identify the best places to site artillery, remains today in the business of creating and publishing maps of the British Isles of such accuracy, precision and beauty as to dazzle the beholder. There is an axiom, universally held in the Kingdom, that whatever an Ordnance map may indicate, one can be absolutely sure it is, in description and location, exactly and canonically right.

Which is why, some 15 years ago, while I was leafing through a few maps in London, I was puzzled to see inscribed on Survey Sheet 55, which covers that small area of western Scotland titled "Lochgilphead & Loch Awe," a single, curiously unexpected word.

It had been written in blue, in the middle of a strait that separates two Inner Hebridean islands—one small and little known called Scarba, and another, larger, called Jura. At the northern side of this strait, two-thirds of the way toward its Atlantic exit, the map said, with neither comment nor explanation, "Whirlpool." The body of water in which it was sited was known as the Gulf of Corryvreckan: whatever it was that lurked two-thirds of the way along it was therefore known as the Corryvreckan Whirlpool.

But hold on! Whirlpools, I thought, were mythical entities, not the kind of thing to put on a modern-day map. Having the word there somehow diminished the chart—made it look like an ancient portolan illustrated with sea serpents, or one of those fanciful boreal symbols denoting an area notorious for gales. A whirlpool surely wasn't a real thing—it was more of a symbol, a personification of the worries of ancient mariners, like a kraken or a Minotaur or a mermaid. A myth, in short, like Ulysses' Charybdis.

So, I assumed—wasn't the Corryvreckan Whirlpool likely to be just the same, just a myth, an exaggerated memory, the stuff of Celtic legend, in the way that Charybdis was part of the mythic sagas of Greece? Surely in reality it wasn't any more than I had assumed all whirlpools to be—a temporary thing, like the vortex in the bathtub, a momentary eddy in a river, a rush of current in an estuary?

Yet because it was written on the map, perhaps it did have to be something extraordinary. Perhaps in fact there was a whirlpool in Corryvreckan that was so huge and infernal and unexpected that it was not a chimera at all, but fixed into the ocean so firmly that it could be called *permanent*. No one I spoke to in London seemed to know for sure. Only a visit could settle the matter.

The nearest railway station appeared to be Oban, a good ten hours by sleeper from London. Long enough a

Svein Johnsen, 45, and his son, Magnus, 10, sit on the front porch of their home, just 150 yards from the Norwegian whirlpool called the Saltstraumen. Svein Johnsen has been taking visitors to see the whirlpool up close for years. Even so, he must be careful. The currents there took his brother's life in 1963.

journey to read something useful about the coastline I was due to visit. With three recommended items—a large-scale chart of the Gulf of Corryvreckan and Approaches, a battered copy of the 1958 Royal Navy's *West Coast of Scotland Pilot*, and a more up-to-date *Yachtsman's Pilot*—I studied as the train roared northward through the night. The mariners' chart noted the site with only one spare and simple phrase: "Dangerous tidal streams." The Admiralty *Pilot* was a little more expansive, devoting two full pages to the phenomenon, with phrases such as "heavy overfalls extend as much as 3 miles seaward . . . very violent and dangerous turbulence . . . no vessel should then attempt this passage without local knowledge." Only the more modern work mentioned the magic word, though being circumspect, the author having placed it between inverted commas. "The 'whirlpool' of Corryvreckan," it said, is in "one of the most notorious stretches of water anywhere around the British Isles."

It was raining at Oban, with a stiff westerly wind. The map in the station hall suggested a complicated journey: the closest inhabited site was an island called Luing, which could be reached by car from another island called Seil, which was itself joined to the mainland by an 18th-century bridge. I drove there, crossed the ancient and alarmingly humpbacked structure, and stopped at an inn on the far side. Aye, said an old man at the bar, he knew well of the Corryvreckan. The "old hag," they called it locally. The *Cailleach*. Corryvreckan, or *Coirebhreacain* in Gaelic, means in one translation "the cauldron of the speckled seas." In another, the cauldron that centuries back had drowned one Prince Brecan, who was the son of Lochlin, then the king of Norway.

It was a terrible, magnificent thing. Many had died in it, the old man said. His own brother was one such, who had drowned in the whirlpool 30 years back, coming home from a fishing trip.

One hour and one soaking ferry crossing later and I was with a boatman who agreed that he was foolish enough to make the journey to look upon the beast. A small sum in folding money had changed hands, and I, by now swathed in a borrowed set of orange oilskins and a black sou'wester, clambered down into his little fishing boat, a sturdy and well-worn thing of many years. As I steadied myself between the piles of lobster creels and coils of old blue rope, we swept out of the calm of Cullipool's harbor on Luing and into the gray chop of the sound.

In this photograph taken from a bridge, Johnsen's boat fights the surging waters of the Saltstraumen. These are some of the strongest tidal currents in the world, reaching speeds of up to 20 knots at each ebb and flow. The churning seas attract a rich variety of marine life.

Oddleif Nilsen's fishing boat leaps and tosses in the grip of the maelstrom called the Moskstraumen, near the town of Å on Norway's Lofoten Islands. Here, two tides meet to create violently disturbed seas that throw the 24-foot boat about as if it were a tub toy.

The rain had stopped, but the wind was decidedly westerly, and freshening. The tide was just now slack and about to turn on the flood. "The right time," said the boatman, "the perfect time to see the old hag do her worst."

We motored steadily south, with Luing on our left, the grassy mass of Lunga to our right. The boatman talked ceaselessly, pointing out the islands that we passed. Behind Lunga rose the peaks of the Garvellachs, where Saint Columba is said to have stayed back in the sixth century. There was a lighthouse, Fladda, and the old slate quarries of Belnahua, flooded and abandoned after a mighty storm back in Victorian times.

The waves became stronger as we chugged onward. At the south end of Lunga was a narrow strait into which seawater seemed to be pouring and churning, like a furious river. The Bealach a' Choin Ghlais, the boatman pointed out on the chart—the Grey Dogs. A shortcut over to the Garvellachs, he said, if you had the stomach for it. Locals say it was used as a backdrop to simulate the Corryvreckan in *I Know Where I'm Going*, a film in which the climax was played out in the whirlpool. "But they wouldnae film in the Cailleach herself," he said. "Far too risky, what with all their precious cameras. Mind you, on a braw day, the Grey Dog can be a fierce thing herself."

And then we rounded Scarba and turned due west at last, and into the mouth of the notorious gulf. Jura was now on our left, and the hills began to close in. Directly ahead, far away, lay open water—the Atlantic Ocean, uninterrupted until the coast of Newfoundland. But between our little boat and the ocean swells, at a point where, a half-mile ahead, the black walls of Scarba pushed toward Jura until the gulf was no more than 1,100 yards across, there was, all of a sudden, a ragged line of white. Breakers. Spray. And, faint at first but growing above the throb of the diesel engine, a steady growling roar.

"Hold on!" cried the boatman, and he accelerated to make sure the craft didn't get spun down into the center.

"That'll be her," said the boatman, with a look of mischief. He turned his pipe bowl uppermost, and pulled his sea bonnet down over his face. His hands gripped the wheel more tightly, his knuckles whitening. "We could be in for a little wetting," he said. "It's the perfect tide for it. A flood tide and a westerly gale. Ideal, if you know what you're about."

And as he said this, so the little fishing boat began to rear and pitch in the strangest way—her bow first turning this way, then another, seemingly quite beyond the control of the wheel. Currents began to tear her off her course, and the rocks—less than a hundred yards off the Scarba shore—began to race by, now on the starboard side, now ahead, now to port, now astern, as we wheeled round, caught by forces unseen, deep, hugely strong.

"Watch the sea!" he shouted, and pointed to the right, to where the surface of the water seemed suddenly oily, as though there were a puddle of grease on top of it, a hundred feet across. I gazed at the flatness until, without warning, a plume of contorted and confused water belched upward, then fell back upon itself and began in a matter of seconds to swirl into a vortex—a real, perfectly formed whirlpool, 30 feet across, with us perched delicately on its edge.

"Hold on!" cried the boatman, and he accelerated, at first gently, then more fiercely, to make sure the craft didn't get caught and spun down into the center. We edged out away from the lip, only to find, quite unexpectedly, that another flat circle of oily-looking water had appeared ahead of us on the left. Its flatness then promptly vanished, too, into an eruption of swirling green water, and its new currents licked at us, prompting another change of course, another burst of engine—after which there was another, and another and another.

It was for fully an hour that we reared and plunged in this manner, and the waters boiled and bubbled around us, and the Scarba cliffs, black and jagged and streaming with water, came worryingly close too many times for comfort. And then, just as suddenly as it had begun, it was over. We had gunned our engine one final time, had set a course due west, had climbed through what seemed a wall of green, a standing wave that always lay between the whirlpool and the open sea—and everything was immediately and thankfully quiet, a perfect calm. The sun had come out and glinted on the ironbound cliffs. Seagulls and cormorants wheeled on the falling winds. Dolphins played beneath our bow. Seals slipped sleekly off the rocks. Peace settled upon the sea, and but for a low and gentle roaring from astern, the Whirlpool of Corryvreckan might have been a chimera after all.

"And that," said the boatman—his pipe now right side up, a newly lit plug of black shag glowing in the bowl—"is the first of five."

The Corryvreckan, he went on to explain, is the worst permanent whirlpool

**Fisherman and maelstrom guide** Nilsen holds a sun-dried cod from the seas near the village of Å, background. The warm Gulf Stream and the strong tidal currents of the region offer ideal conditions for the cod on which the town thrives.

A tide fall of up to 28 feet, and six-knot currents, produce the series of whirlpools and tidal swirls called the Old Sow and Piglets, in Passamaquoddy Bay, at the border between Maine and New Brunswick. The Old Sow forms about three hours before high water.

to be found in Britain. But sailors who make a study of heavy-weather sailing know there are in fact more. This, he said, isn't the worst in the world. There is one in Norway so terrible that its name has become part of the English language—though for the life of him he couldn't remember its name, and we chugged home to Cullipool in silence, with my teeth in any case chattering too much with cold for any sensible conversation.

He remembered later, as we dried out in his living room. "The Maelstrom," he announced. "The very grandest of them all."

There are indeed a number of whirlpools in the world that have enough permanence about them to be fully deserving of the name. Definition is important, though. Small, temporary, harmless eddies that resemble whirlpools are commonplace. Every river with any power seems to generate them at some point in its course, as the water plays with the irregularities of the banks, divides, washes back upon itself, rejoins the stream a little later. Traveler and writer Jonathan Raban describes the ferocity of the "boils" in the Mississippi in his classic 1981 book *Old Glory: An American Voyage*. The swirling waters to be seen off Hock Cliff along England's River Severn are well known. More trivially, every bath generates a whirlpool as it empties.

The ocean, too, has momentary whirlpools aplenty: for instance the wild, whirling tidal races, called Swelkie, of the Pentland Firth, between the Orkney Islands and the Scottish mainland, where the currents of the North Sea and the Atlantic flow back and forth; or the Strait of Messina, where the Ionian and Tyrrhenian seas meet, the site of Homer's Charybdis; and of still more to be seen in the waters between Greece and the island of Evvoia, where Aristotle is said to have drowned.

But there seem to be just five that are wild enough and big enough and fa-

But in Norway there lies the most famous of them all. This is—or, to put it more accurately, these are—the Maelstrom.

mous enough to be thought of as permanent, repeatable features of the sea. The Corryvreckan is one. The small but fierce Naruto Whirlpool off the eastern end of the island of Shikoku in central Japan is another. The Old Sow, which lies off the southern tip of Deer Island, New Brunswick, is a third.

But in Norway there lies the most famous of them all—and the only one that has so far received anything approaching close academic study. This is—or, put more accurately, these are—the Maelstrom.

For there are two maelstroms in Arctic Norway, and it took me a day's wandering and inquiring to find out which one was which. Murphy's Law ensured, of course, that the easier of the two to reach, and which is called the Saltstraumen, was not the one for which I was looking.

Not that the Saltstraumen is unspectacular. It, like all whirlpools, is a tidal affair, seen and heard best when the tide is racing in either the flood or the ebb. It is close to the small town of Bodø, at a point where the tidal waters of one of the deep ocean fjords rush into a narrow channel between two great granite islands called Straumøya and Knapplundøya.

Four times a day, as regularly as the moon and sun dictate—and a timetable is published every year, for visitors, with the spring tides (which make for a greater spectacle) marked in bold—the tides rush in and out. As they do so, crucially, their waters pass over a narrow ledge of rock that suddenly spikes upward from the seabed. The deep currents smash against the rock, the water is forced upward to where it meets surface water going even faster—the result being the creation of trails of long, ragged whirlpools, lines of which can be seen roaring along the currents, into or out of the sea.

The Saltstraumen is both dangerous and yet at the same time curiously benign. The boatman who took me out, in a small aluminum skiff that looked dismayingly puny, had lost his brother as a child, swept in while he was fishing for mackerel. And at close quarters the waves are fierce, the power stupendous—although, unlike the Corryvreckan's maverick behavior, they are wholly predictable. But what gives the Saltstraumen the appearance of vincibility is that a road bridge stretches high above the torrent—and the whole episode can be viewed from the comfort of a concrete sidewalk, 120 feet above the water.

What goes on below the surface has been studied in detail at the one whirlpool that, as my Scottish guide mentioned, has added a word to the English lexicon: the Maelstrom. This region of sea where tide and current, wind and seabed have all conspired to create the most brutal of marine phenomena is properly known as the Moskstraumen: it is also to be found in Arctic Norway, at the southern end of the chain of islands known as Lofoten that lies about 50 miles off the mainland coast.

Between the islands of Scarba and Jura, off the west coast of Scotland, lies the Gulf of Corryvreckan, "one of the most notorious stretches of water" around the British Isles. In this passage is an extremely dangerous, turbulent sea, particularly when the flood tide meets a westerly wind.

## The Maelstrom grinds up all ships who pass through incautiously, turning them into matchwood and oblivion.

The chain is a place renowned for its winter fisheries: from January to April the best cod on earth comes from the Lofoten waters. The seas off the archipelago are exceedingly complex, with black deeps and sudden shallows, weird currents and dense fogs. The seamen who occupy their business here are skilled, wary, courageous. And they know full well the dangers of the whirlpool that rages between Lofoten Point and the tiny off-island called Værøy. Not for nothing, they say, is the long-abandoned village that overlooks the swirling torrents called Hell.

We set off—from a fishing village that was called simply Å—in a powerful rubber boat. The skipper was Stig Einarsen: he had hands the size of dinner plates and the stance of an ox. There was a lumpy following sea, and we bumped uncomfortably southward, the cliffs rising ever higher on our right, flocks of seabirds swooping down to see who was bent on such madness.

Einarsen stopped for a moment off the lighthouse at the point and asked if we felt content and confident. Getting the answer he wanted he then floored his engine, rounded the ledge of cliffs—and the gray waters hit us like a sudden succession of hammer blows. Edgar Allan Poe, I later read, had it just about right when in 1841 he wrote:

"Even while I gazed, this current acquired a monstrous velocity. Each moment added to its speed—to its headlong impetuosity. In five minutes the whole sea . . . was lashed into ungovernable fury. . . . Here the vast bed of the waters, seamed and scarred into a thousand conflicting channels, burst suddenly into phrensied convulsion—heaving, boiling, hissing. . . . "

Off the wild and craggy Scottish isle of Scarba, dry-suited tourists in a big inflatable boat brave one of the Corryvreckan's most formidable features—a 15-foot standing wave that rises in the middle of the channel at the height of the tidal rip.

It was indeed a tremendous display of the power and might of fast-running, uncontrollable water. We bucked and twisted, rose near vertical, plummeted deep into troughs, spun round and round, took heavy waves from every side. Occasionally Einarsen, who knew these seas like the pattern of his grandfather's oiled-wool sweater, would duck the boat into a peaceful inlet. From there we would watch the chaos rage for a few drenched moments, before venturing out into the roaring and the cold once more. And just as the Scottish boatman had done years before, he kept us there for a full hour until, with a grin, he finally relented, set the lighthouse on our port beam, and zoomed north past the point and out into the calms where the fishing boats lay, before chugging us steadily home, out of the rain.

On the way, he told us a little of the stories that have surrounded this mighty force—of how Poe had written an entire story about it, of how Jules Verne had used the Maelstrom as the place in which to destroy the *Nautilus*, and of how 1,000-year-old Nordic legends related that two giant millstones had sunk off Scotland, and had rolled across to these islands, grinding away still, making the

sea as salty as it is today. The whirlpool appears on a map in the great *Description of the Northern Peoples*, published in 1555, and I've seen it on 17th-century charts of the Hanseatic League. As we came into port that evening, we could see a flag fluttering above the town hall: it was blue and, lest anyone forget, had a white whirlpool at its center.

But what are these things? Why do such whirlpools form? Why are they so fixed, so dangerous, so legendary?

They have their similarities and differences. The Corryvreckan is perhaps a quarter of a mile across, with its great belches of water appearing randomly, whirling dervishlike for a few moments before being replaced by others just as wild. The Old Sow is a thing of lumpy waves and one large sinkhole of water that seems to suck into itself for many minutes at each flood tide. Japan's Naruto Whirlpool, which also can be viewed from a highway bridge, is much like the Norwegian Saltstraumen—small chains of whirling water racing down the currents, neat and tidy in its sudden spasms of violence. The Maelstrom somehow combines all of these into one huge area of mightily confused sea, gray and ponderous in the way that it grinds up all ships who pass through incautiously, turning them into matchwood and oblivion.

Easdale, on Scotland's west coast, lies ten miles from the Corryvreckan and is the departure point for those who wish to try the passage. The island of Scarba rises in the right background. At the height of its turbulence, the Corryvreckan produces a thunderous sound that may carry all the way to town.

Bjørn Gjevik, working at the University of Oslo, wrote a study of the Maelstrom in 1997—one of the few extensive mathematical studies that I've been able to find of the aqueous complexities that whirlpools seem to be. What he found seems, at first blush, to be common among the great whirlpools.

By making careful measurement of the speeds of waters at different levels and at different places and times of night and day and month and season—a monstrously difficult and dangerous task, one has to assume—he seemed to think that it was "eccentricities on the bottom of the sea" that were the key.

These submarine phenomena—rocks, shelves, ridges, peaks—conspire with the furious winds and with the great concatenations of tides and currents. They produce what Gjevik calls in his paper an "exceptional strong topographic enhancement" of what might otherwise merely be a very strong oceanic tidal flow. They interrupt the smooth passage of water and make its submarine motions become infinitely more complex—and while whatever happens deep under the sea still remains a mystery, what happens up above, on the surface, is in these places self-evident, dramatic and spectacular

In other words, whirlpools—the Maelstrom especially, the others most probably—are fluid marine phenomena that have solid submarine causes. There is the pinnacle that rises underneath the Saltstraumen. There is a shelf of rock that rears up in the Corryvreckan. There are shallows that the charts of Norway show south of Lofoten Point. There are ridges of rock under Japan's Naruto Strait such as to allow a bridge to be built across it. And a number of near-islands loom perilously beneath the keels of such boats as pass beside the international boundary in the tidal estuary that divides the state of Maine from the Canadian province of New Brunswick.

Shallowing, in short, is what it is all about. A narrow passage, a fast-speed-

. . . then the waters begin to eddy and swirl, vortices form, immense sounds begin to thunder and spray fills the air.

ing current, howling winds, large tides—and beneath all of these things a sudden, dangerous, confusion-causing shallowing. When these conditions all combine—then the waters begin to eddy and swirl, vortices are formed, immense sounds begin to thunder, spray fills the air, and all around the region notices are posted to warn sailors that to pass through this or that at flood or the ebb is at your direst peril.

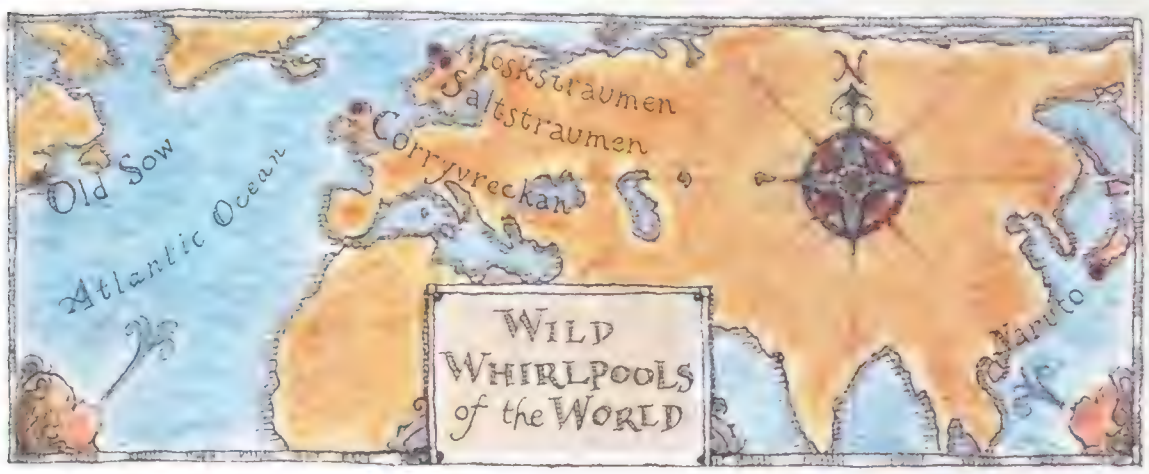
Which does little for the sense of legend, of course. The Nordic saga writers and the Gaelic poets and those who still today give out survival certificates in Maine for those who brave the Old Sow in full spate might not prefer a rational explanation. Tales of long-dead Norwegian princes do much to add luster to a legend: to have science bring explanation steals the pleasures of romance.

But it is an ill wind. Some people will be more than happy at what Bjørn Gjevik of the University of Oslo seems to have found. Britain's Ordnance Survey, for example, will be pleased at the news that whatever occurs in the Gulf of Corryvreckan, at the very least, probably owes its existence to the presence of rock below the surface of the sea. And that is because a rock, whether it is seen or unseen, is a thing of undeniable permanence—which means by extension that any disturbance it creates, far from being a myth, truly is permanent as well.

And if the Corryvreckan really is a permanent phenomenon, then surely, the Survey will say, there unarguably does deserve to be written in indelible blue printing on the best and most accurate maps that are made the single word "whirlpool." Accuracy in the Ordnance Surveys is all; and if the Corryvreckan Whirlpool is proved to be a thing of permanence, then this map, like all the rest, is happily and precisely right.

*Simon Winchester last wrote in September 1998 about the editor of the* Oxford English Dictionary. *His book* The Map That Changed the World: William Smith and the Birth of Modern Geology *(HarperCollins) will be out next month. Peter McBride's photographs of the rock-climbing dance performers of Project Bandaloop appeared last September.*

***Fancy a spin in one of the world's wildest whirlpools?***




**"THE BOAT APPEARED** to be hanging, as if by magic, midway down, upon the interior surface of a funnel vast in circumference, prodigious in depth, and whose perfectly smooth sides might have been mistaken for ebony, but for the bewildering rapidity with which they spun around, and for the gleaming and ghastly radiance they shot forth," writes Edgar Allan Poe about Norway's Moskstraumen whirlpool.

**YOU DON'T NEED** a near-death experience, such as the terrifying moments encountered by Poe's character in *A Descent into the Maelström*, to appreciate the raw strength of a whirlpool, one of nature's truly remarkable phenomenons. But there's nothing like feeling the pull and tug of a whirlpool in a boat to understand the power of the sea. You may have to brace yourself, however, for bad weather: strong currents, big waves and fierce winds create the best conditions to see a whirlpool in all its ferocious glory. Try to time your visit during the full or new moon, when spring tides are at their most powerful. (Check out www.bodoe.com to find a tide table for Norway's Saltstraumen.) For those allergic to small boats in stormy weather, the Saltstraumen and Japan's Naruto are visible from bridges.

**ALL OF THESE** whirlpools are off the beaten track, which makes getting there half the fun. By luck or happenstance, reports author Simon Winchester, the nearby towns offer exquisite local charm replete with cozy and idyllic inns.

Visit **www.smithsonianmag.com/journeys** for tips about getting to these sites and for more about whirlpools.

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ASPIRIN

# TAKE AND CALL ME IN THE MORNING

**ONCE WE DIDN'T KNOW HOW ASPIRIN WORKS; NOW WE KNOW THAT IT DOES A LOT MORE THAN EASE PAIN AND INFLAMMATION ◆ BY JAKE PAGE ◆ ILLUSTRATION BY TIM JESSELL**

FIFTY THOUSAND PEOPLE watched as 30 mountaineers arrayed a skyscraper in the German town of Leverkusen with 32 enormous strips of cloth weighing in all nearly nine tons. This was not fine art, such as that by the artist Christo who wraps huge features of the landscape in the name of aesthetics. No, this was pure commerce. For this was the headquarters of the German company Bayer AG, and the cloth strips had turned the building into the largest package of aspirin in the world.

The occasion for all this hype was the 100th anniversary of one of the most-used drugs in human history. It is a fair bet that many readers of this magazine take an aspirin a day as a preventative of heart attack, certain forms of stroke, or other threats. I do. Aspirin seems to have other beneficial effects, including possibly lowering the risk of various cancers of the digestive tract. Recently, a British study found that low doses of aspirin may contribute to a successful pregnancy for women with a history of late miscarriages. How does it do all that?

How aspirin works was a mystery that lasted the better part of a century. In the 30 years since the basic mechanism was uncovered, it has continued to yield its secrets, about how it helps and also how it can harm. Some people are allergic to aspirin, and for some it can cause stomach irritation and even severe internal bleeding, especially with heavy doses or long-term use. The ill effects, which make aspirin a two-edged sword, are now better understood, too, letting drugmakers dream of an even more wondrous wonder drug.

This is what the Bayer laboratory looked like about 1900. The blur on the floor at right is a dog who had the run of the lab but would not sit still for the photographer.

Americans swallow 12.5 billion aspirin tablets, gelcaps and caplets a year. There is probably no way of calculating the tonnage consumed worldwide in its 100-year history, and in much of the world where fancier analgesics are too expensive for most people, it is the pain reliever of choice.

Now your modern herbalist healer will point out that the use of the chief ingredient of aspirin is thousands of years old—not the mere century celebrated in Leverkusen—and that is sort of true. About 2,400 years ago Hippocrates prescribed bark from the white willow tree (*Salix alba*) for such ailments as pain and ague. Besides using the bark of various willow species, healers found they could brew tea from the flowers of meadowsweet to relieve fever.

The active ingredient of willow bark and meadowsweet is salicin, a bitter-tasting substance. Chemists identified it and made a chemically simpler version called salicylic acid early in the 19th century, which was prescribed as a fever reducer. The problem was that its side effects were ferocious. Enough salicylic acid to make much difference to a raging fever was also enough to begin eating away the lining of the stomach.

The origins of aspirin per se are in the late 1880s when a large German dye manufacturer decided to diversify into pharmaceutical drugs. At new research labs, a young chemist, whose father suffered from severe arthritis pain and therefore was having his stomach eaten away by doses of sodium salicylate, went to work.

The chemist was 29-year-old Felix Hoffmann. After a flurry of experimentation, he hit on the notion of adding to salicylic acid an acetyl group—giving it a hook-shaped tail of carbon and oxygen atoms—and thus the wonder drug of all time was born. It was an immediate sensation.

So goes the popular story.

In fact, Hoffmann simply found a more efficient way to make acetylsalicylic acid (called ASA), a substance that had been known for some 40 years. And at Bayer, Hoffmann's ASA sat on the shelf for more than a year, the belief at the time being that, along with its other side effects, salicylic acid "enfeebled" the heart, and Hoffmann's superiors assumed that ASA would do the same. To be sure, at the time Bayer was preoccupied with the spectacular success of another drug used in cough syrups that not only cleared up cough but gave the cougher a heroic feeling. They called it heroin. But eventually ASA got its test and proved highly effective as a fever and pain reducer, and Bayer put it forth under the name "aspirin," which could be remembered, pronounced and, importantly, trademarked.

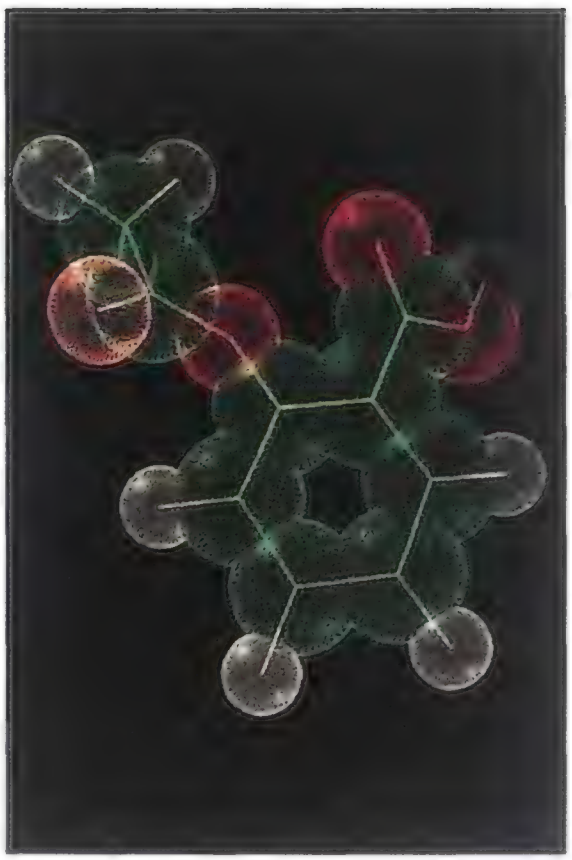
The name derives from the genus classification for meadowsweet at the time, *Spiraea*, which led to the German name for ASA: Acetylspirsäure. With the selection of some letters from this jawbreaker, aspirin was born in January 1899 and, more to the point, Bayer aspirin. So aspirin, with heroin and a few others, was among the first drugs to be called something other than its formal chemical name. (Today, on the shelves of a local drugstore, I can find a dizzying array of aspirin-containing products or other nonsteroidal anti-inflammatory drugs [NSAIDs, and pronounced ensseds]: Anacin, Ascriptin, Alka-Seltzer, Ecotrin, Bufferin, Dristan, Excedrin and Motrin, to name just a few. Of course, several brands of just plain aspirin are available—from Bayer and St. Joseph to the even cheaper versions put forth by the drugstore and supermarket chains.)

The name aspirin was important. For example, the statement, "Take two acetylsalicylic acid tablets and call me in the morning," probably would not have caught on, even as a joke. And with the birth of the name, the rest, as they say, is history: a tangle of spectacular merchandising, squabbles over patents, corporate feuding and shenanigans, smuggling, and a nearly endless string of lawsuits.

In its early days, the Germans sold Bayer aspirin as an "ethical" drug, meaning it was advertised only to

physicians and could be bought only with a prescription, and when they opened up their American Bayer company, they did the same—with phenomenal success in both the United States and Latin America. When the United States entered the Great War in Europe, the Bayer company in America was tainted as profiting the kaiser and his works, and the German managers of the company were arrested as spies. Next, the company was seized by the government and, at war's end, put on the block. It was bought by a patent medicine purveyor, Sterling Products, Inc., that peddled laxatives, dandruff remedies and other nostrums.

In 1920, in a complex lawsuit brought by a competitor, Sterling's American trademark on the name aspirin was voided at the retail level, Judge Learned Hand ruling that the word was by then generic in the public mind. Since that decision, the aspirin business has been something of a free-for-all. (These commercial, regulatory and other battles have been chronicled with admirable flair by Charles Mann and Mark Plummer in *The Aspirin Wars*, a book that the authors suggest might well serve as a case study in business ethics.)



In this schematic of an aspirin molecule, the acetyl group at upper left is connected to the salicylic acid by one (red) oxygen atom.

One of the saga's highlights was the competition from Anacin, which began as a medicine sold to dentists for the pain of extraction. It originally consisted of four separate substances, the main one of which was aspirin; the others (including caffeine) were of dubious efficacy. Who can forget that Anacin brought "fast, *fast*, FAST relief"?

Aspirin sales were soon buffeted by other new products—new *improved* products, of course. Also, the old no-

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tion (that aspirin could have ill effects on the heart) continued to lurk in the public mind. To refute that, Sterling ads, often anchored by a photograph of a gorgeous nurse, said in boldface: "DOES NOT AFFECT THE HEART."

Oops.

The government objected, there being no evidence either way, and the line was dropped. Fifty years later, Sterling advertised that aspirin does indeed affect the heart, but in a beneficial way. For a brief time the company advertised that aspirin could prevent first heart attacks. The government made them stop. Oops again. But the way was cleared for ads saying that aspirin reduced the risk of a second heart attack.

By then there were other products that were supposed to have less serious effects on the gastrointestinal (GI) tract. Other NSAIDS included ibuprofen, marketed as Advil and Motrin, among other trade names. Acetaminophen, best known as Tylenol, is not an NSAID but is a frequently recommended pain reliever. Aspirin was in trouble. Prospects only worsened when medical studies implicated children's aspirin in Reye's syndrome, a potentially fatal but rare children's disease that occurs as a complication from a viral illness such as flu or chicken pox.

Well before all this bad news, as early as the 1950s, a California family doctor named Lawrence Craven had found that a daily dose of aspirin seemed to prevent coronary thrombosis (the building up of a blood clot in the vessels supplying the heart), a major cause of heart attacks. He went on, over the years, to prescribe aspirin to about 8,000 patients, none of whom died from coronary or cerebral thrombosis, but his findings were largely ignored.

"He was a good doc and an astute clinical observer, but he published his results in an obscure place," says William T. Beaver, a professor emeritus of pharmacology and anesthesia at Georgetown University School of Medicine who has studied the efficacy and side effects of analgesics for the past four decades.

Indeed, as the anticoagulant effects of aspirin came to be more widely perceived, a 1944 report in the *Journal*

Aspirin is king of the mountain in the Bayer flyer sent only to physicians. Heroin is offered as a sedative for coughs. Somatose, naturally, was for insomnia.

Originally aspirin was sold as a powder, as were many other medicines. The company began to sell it as imprinted tablets in 1914.

*of the American Medical Association* even suggested that the drug was unsafe. But then along came the realization that old Doc Craven had been right, and the aspirin makers in the United States were saved again. Doctors began telling people at risk for heart attacks that an aspirin a day kept the grim reaper at bay, and sales soared. We are talking about millions of dollars here. One baby aspirin (81 milligrams instead of the usual 325 of a regular aspirin) a day seems to be enough for most people

The Physician's Health Study in the 1980s, a long-term monitoring of 22,000 doctors, found that aspirin in small doses every other day may reduce the risk of a first heart attack by 44 percent. Other studies have shown that aspirin can lower the risk of a second heart attack by 30 percent and death during a heart attack by 23 percent as well as reduce the risk of most strokes and their recurrence by about 25 percent. Epidemiological research has revealed that regular aspirin use may protect against the risk of colon cancer by as much as 40 to 50 per-

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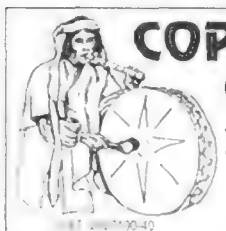

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cent; esophageal cancer by about 80 to 90 percent; and ovarian cancer by some 25 percent.

On the downside, long-term use can cause gastrointestinal ulceration or bleeding, with an increased risk of blood leaking into the brain, causing a different kind of stroke. A severe asthmatic reaction can occur. Nor are the benevolent figures certain; more research is needed in every area. In the meantime, the question of whether to take aspirin and, if so, how much, is one to be discussed with a physician.

This is doubly so for women. Most, though not all, studies of aspirin's effects have been done on men. A giant study of aspirin and women age 45 and over is under way, its results not due until 2004. But one of its coinvestigators, Dr. JoAnn Manson, who is also chief of preventive medicine at Harvard's Brigham and Women's Hospital in Boston, says the main question is "the proportional risk of heart attack versus stroke in men versus women." Heart attack rates in women under 65 are far lower than in men, she says, so an increased risk of stroke due to aspirin might offset its benefit to the heart. At the same time, some women as well as men are subject to a dementia brought on by blocked vessels in the brain caused by numerous small strokes over time. This risk may be reduced by aspirin.

In any event, nowadays many people who are old enough to remember listening to, say, the radio version of the *Lone Ranger* do take an aspirin a day. This set me to wondering how exactly it does its magic. Thus did I metaphorically mount my great horse Silver and ride off into the microscopic wild lands of biochemistry. There, in and around every cell and through every vessel flow innumerable kinds of proteins all in bewildering profusion, summoning each other to duty, catalyzing activities, changing form in a cascading continuum of mini-functions—the constantly changing chemical labyrinth that runs the overall operation that is you or me.

Evidence that aspirin reduces the risk of heart attacks was big news. Patients should still check with their doctors, however.

The first major insight into what really happens when a few milligrams of acetylsalicylic acid are tossed into the mix came from an affable-looking British pharmacologist, Sir John Vane, who shared the Nobel Prize in Medicine in 1982. Vane found that aspirin blocks the formation of hormonelike molecules called prostaglandins, which cause the inflammation, pain and fever we are taking aspirin for in the first place. Specifically, aspirin stops the enzyme that catalyzes the production of prostaglandins. The enzyme is called cyclooxygenase, universally known as COX.

One of these prostaglandins, called thromboxane, is produced in the tiny blood cells called platelets that stick together to plug up leaks when you cut yourself. Aspirin halts thromboxane production, and without it, the platelets are less sticky. Blood will still plug up a cut or a scratch but more slowly, and it is a lot less likely that platelets will clump together to the extent that they plug up an artery. Aspirin's ability to get those platelets just swimming past one another is re-

markably fast, which is why someone in the midst of a heart attack who chews up an aspirin has a better chance of surviving.

The next major insight into aspirin's functioning arose from a challenge issued by a colleague to a young American biochemist, R. Michael Garavito, in the late 1980s when he was working in Switzerland. The challenge was to crystallize the COX enzyme to see exactly what it was, a task that was thought to be so complex that it seemed impossible. If you cannot see what you are working with, you can make inferences about it, but as Garavito (now a professor at Michigan State University) says, it is "like inferring the mechanism of a car engine without lifting the hood."

Now the process of purifying a protein to induce it to crystallize and then using x-ray crystallography to image the atoms is staggeringly meticulous, even tedious, and often a matter of trial and error. It took Garavito (by then at the University of Chicago) and his colleagues nine years, chasing down blind alleys and starting over, to extract the molecule from the biochemical soup, purify it, and finally grow it into crystals. In 1994 the researchers announced their success.

It turned out that the COX molecule has a tunnel-like hole into its interior, and it also turned out that aspirin is just the right shape to slip into the tunnel and create a gate, thus halting or slowing the enzyme's ability to produce prostaglandins. This seems straightforward enough, but there was more to it. Other researchers at UCLA and the University of Rochester had discovered in the early 1990s that there are *two* COX enzymes, nearly identical and one of which was characterized as something of an evil twin.

COX-1, which is the one Garavito crystallized, floats around on cell membranes like a little boat, and takes care of bodily housekeeping, helping to manage the kidneys' functions and protecting the gastrointestinal tract, among many other beneficial chores.

The evil twin, COX-2, comes into being only when there is a crisis: tissue damage of one kind or another. This is the one that pumps out the prostaglandins that make blood vessel walls leaky and bring about pain and inflammation. The prostaglandins it produces also attract immune cells to a damaged area. They swoop in like

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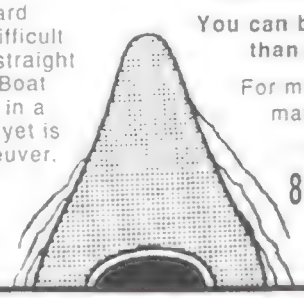

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the Marines to do their needed work, but in chronic situations like rheumatoid arthritis, the immune cells go berserk and attack their host.

(Pain is not all bad, of course, letting one know to take one's hand out of the fire, for example, so COX-2 really shouldn't be thought of as the evil twin in these more multicultural times, just that its misuse by cells can be problematic.)

Aspirin creates a gate in both enzymes—completely closed in COX-1 but ajar in COX-2—hence its beneficial and harmful effects. The inhibition of the COX-1 and COX-2 enzymes gives aspirin its cardiovascular benefits and inflammation-fighting abilities, but the tradeoff can be gastrointestinal problems, ranging from simple irritation to ulcers and even sudden and massive hemorrhage. When aspirin sloughs off cells in the GI tract, however, it may also be removing precancerous or cancerous cells.

Of course, it is more complex than that. Taking an aspirin a day, which does so much good, causes wounds to take longer to stop bleeding, as noted. It also creates in many people occult bleeding, the hidden leakage of blood that can show up in the stool. And this, ironically, confounds those tests one can take at home for . . . you guessed it: colon cancer.

Given this widespread continuum of good and bad effects, Michael Garavito calls aspirin an ax of a drug. His findings and those of other researchers with the COX enzymes suggested that if you could develop a drug that was specific to COX-2 but didn't touch COX-1, you could get the good effects without the potentially disastrous bleeding in the gastrointestinal tract. This would be like using a knife, according to Garavito, rather than an ax. It was in the meantime beginning to be perceived that COX-2 occurs in the brain, and evidence began to accumulate that the aspirin effect also might slow dementia and Alzheimer's.

And at least one form of the knife


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was soon in coming. In 1999 an American drug company began touting a COX-2 inhibiting drug called Celebrex, followed soon after by another company's entry, Vioxx. Both of these drugs were designed for arthritis sufferers. Both are supposed to have substantially fewer effects on the stomach, though no one really knows yet exactly what effects prolonged use of these drugs will have. There simply hasn't been the kind of time needed to find out, says Bill Beaver, who was consulted in the development of both.

New versions of these drugs are already in the pipeline, however. It is a market that reached more than a billion dollars in the first year, after all, so the drug companies are scrambling to board the bandwagon hurtling toward the future. With each new iteration, one can imagine that they will be more and more specific, approaching the third hoped-for generation after the ax and the knife: what Michael Garavito calls a "scalpel."

When you combine that technical wizardry with the brand-new field of genomics (knowing what every gene in the human body does) and the even newer field of proteomics (knowing what every protein in the human biosoup looks like and does), then it may become possible to design drugs that will enhance or block each function. The day will come when we'll leave targeting COX enzymes behind for drugs that will permit even more selective pinpointing, drugs that will work on specific prostaglandins.

As for me, I take my daily aspirin and count my old-fashioned blessings, with a tip of the hat to Herr Hoffmann and old Doc Craven. If it weren't for them, among others, I'd have to spend a whole lot of time chewing willow bark or hunting for meadowsweet. Or worse, pushing up the meadowsweet.

*Jake Page's latest book,* Sacred Lands of Indian America, *will be published in October*


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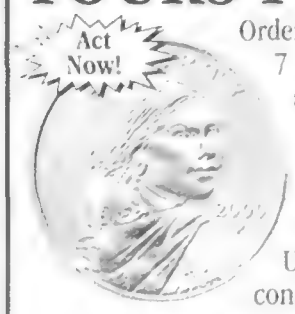


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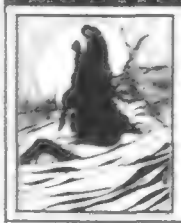

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**Aspirin** [p. 96]

*The Aspirin Wars* by Charles C. Mann and Mark L. Plummer, Knopf, 1991

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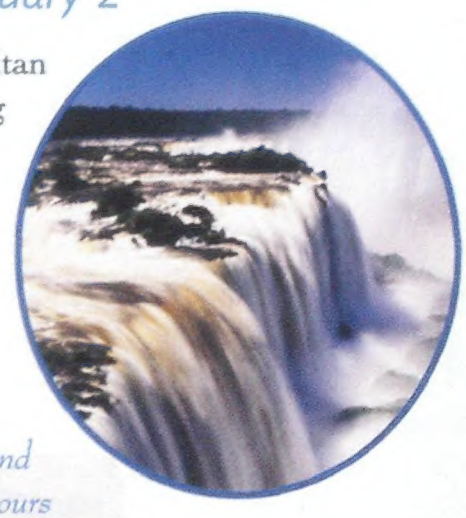

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THE LAST PAGE

# Verbal Shorthand

BY GEORGE BEISWINGER

I DON'T KNOW WHY IT IS, BUT PEOPLE who have been married for a long time tend to cut corners when it comes to spoken language. In fact, if it weren't for pronouns, I don't think many of us could communicate at all. A single word may convey several meanings, thoughts or requests, but somehow each partner knows exactly what the other is saying at any given time.

My wife and I are guilty of using such verbal shorthand. For example, the other evening I asked her if she would please hand me the thing. She knew immediately that I wanted the TV remote.

If she asks me to turn it down, I know she means the TV, if it's on. Otherwise, she's talking about the thermostat. See what I mean? "It" covers many bases. My wife may say, "Please put it back together when you are through." I understand she is referring to the newspaper.

"It's about time for it to come," I might proclaim. This could mean the mail, the paper, the bus, or the cab we called, depending upon the time and context. While in the laundry room, she might remark, "We've got to get a new one before long." "Yes," I reply. "It's given us many years of service." We both mean the washing machine. If she calls from the laundry room and inquires, "Is it on yet?" she means, Are the commercials over and is the program starting?

She may say: "You would think he would be cold out there without a coat." If she is looking out our north window, I know she means Harry next door. If the south window, it's neighbor Bob. But when she asks,

*If she asks me to turn it down, I know she means the TV, if it's on. Otherwise, she means the thermostat.*

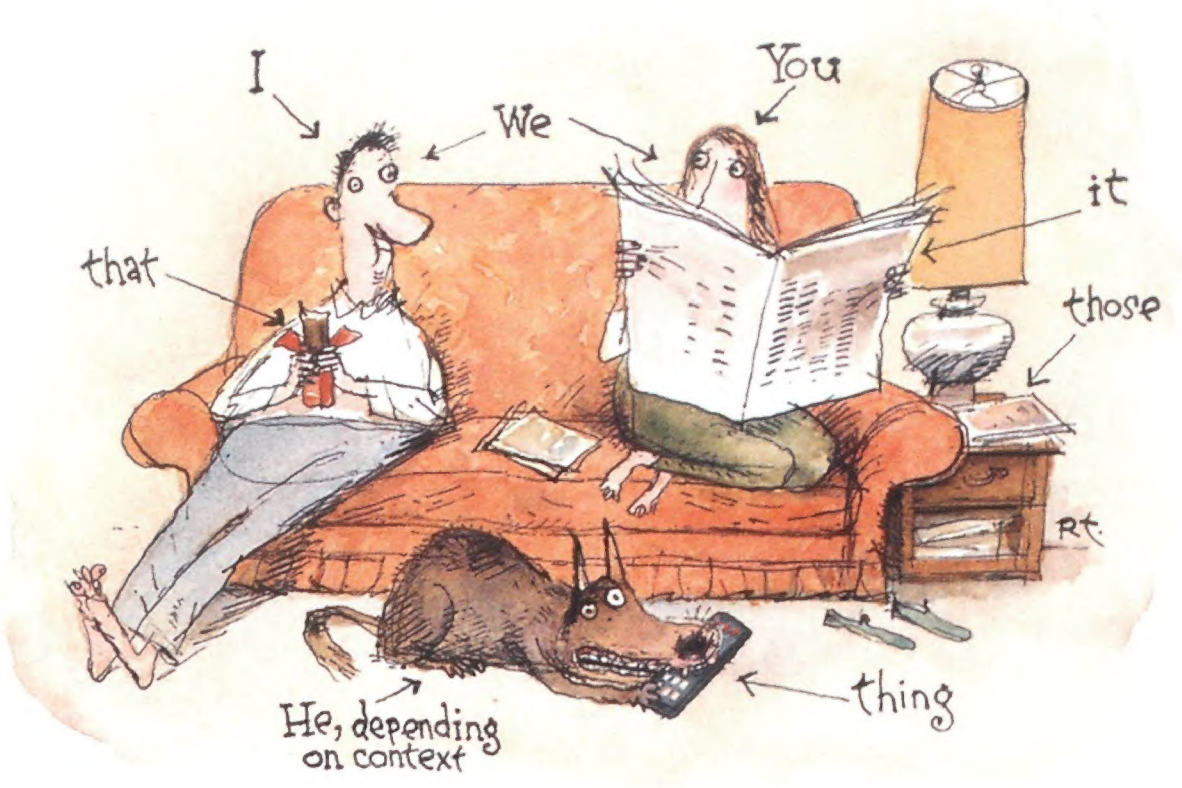
"Has he been out yet?" she means Earl, our dog.

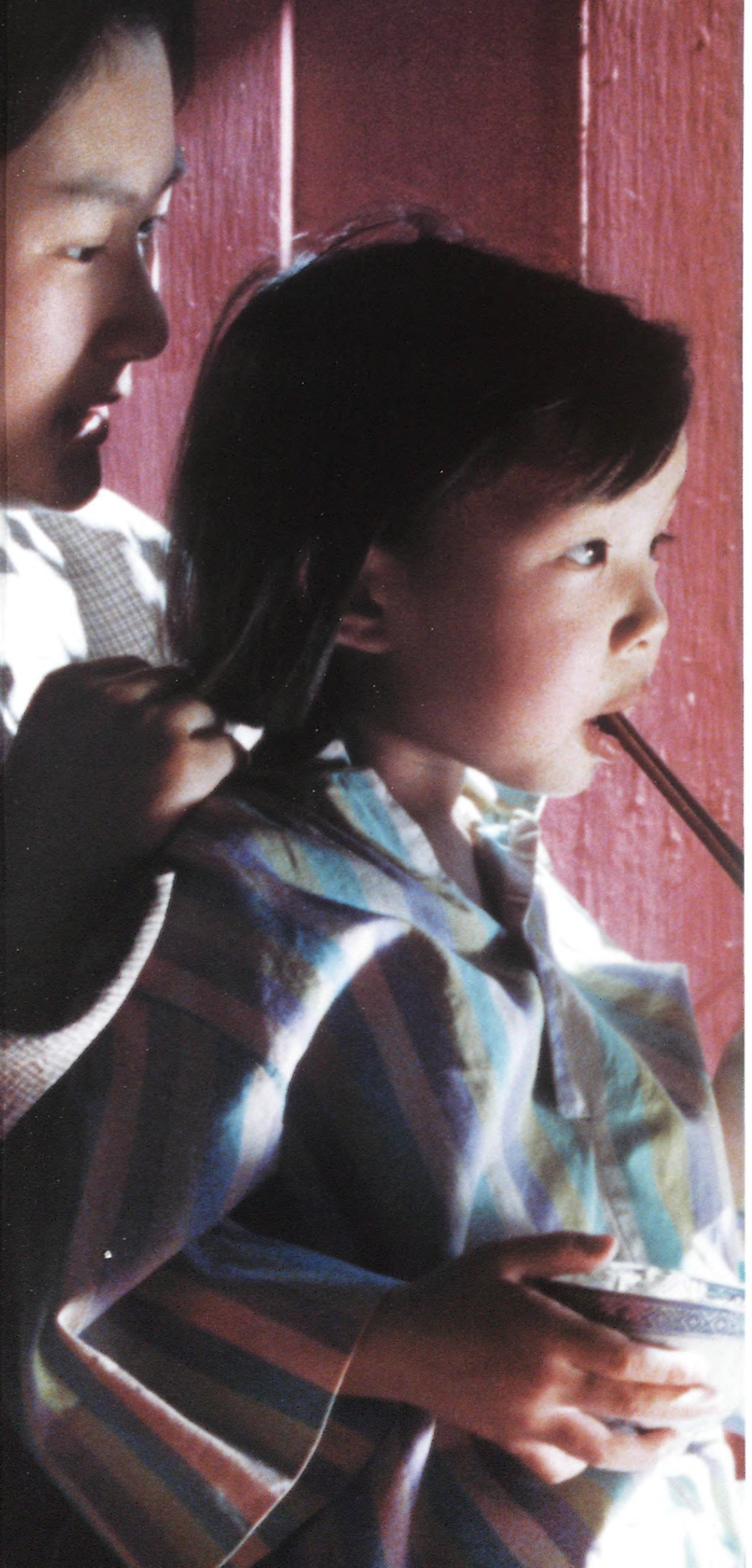
When I exclaim, "I've had it for now!" my wife knows that I'm frustrated with whatever project I've been working on and am ready for a nap. When she says, "You'd better do something for that," I know that she has heard me sneeze. When she's in another room and admonishes, "That will spoil your appetite," she's heard the rustle of my candy-bar wrapper.

If I head toward the garage, she may say, "Don't forget to fill it up." She means the car. But if I'm in the backyard and she says the same thing, I know she means the birdbath. When she says, "I think you can do better than that," I have either just finished mowing the lawn, trimming the hedge or (in winter) shoveling the sidewalk and driveway.

When my wife proffered a box of assorted chocolates the other evening and asked which I preferred, I said, "The one in the corner." I got the one I wanted. I didn't have to say, "the chocolate, nougat and caramel-covered macadamia nut cluster." She knew.

And so it goes. Somehow we manage to subsist on this sparse diet of words. Tonight, after the dinner dishes had been washed, dried and put back in the cabinets, she asked sweetly if I would carry out the garbage. I was a bit taken aback. The first noun today, and it's garbage.





# Biotechnology researchers call it "golden" rice.

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***"When mothers and their children eat an adequate amount of vitamin A in a daily meal, it could help alleviate more suffering and illness than any single medicine has done."***

The excitement expressed by plant biologist Charles Arntzen reflects the golden opportunity that many see in a new strain of rice being developed with biotechnology. "Golden" rice contains increased amounts of beta-carotene, a source of vitamin A. Because rice is a crop eaten by almost half the world, golden rice could help relieve a global vitamin A deficiency that now causes blindness and infection in millions of the world's children.

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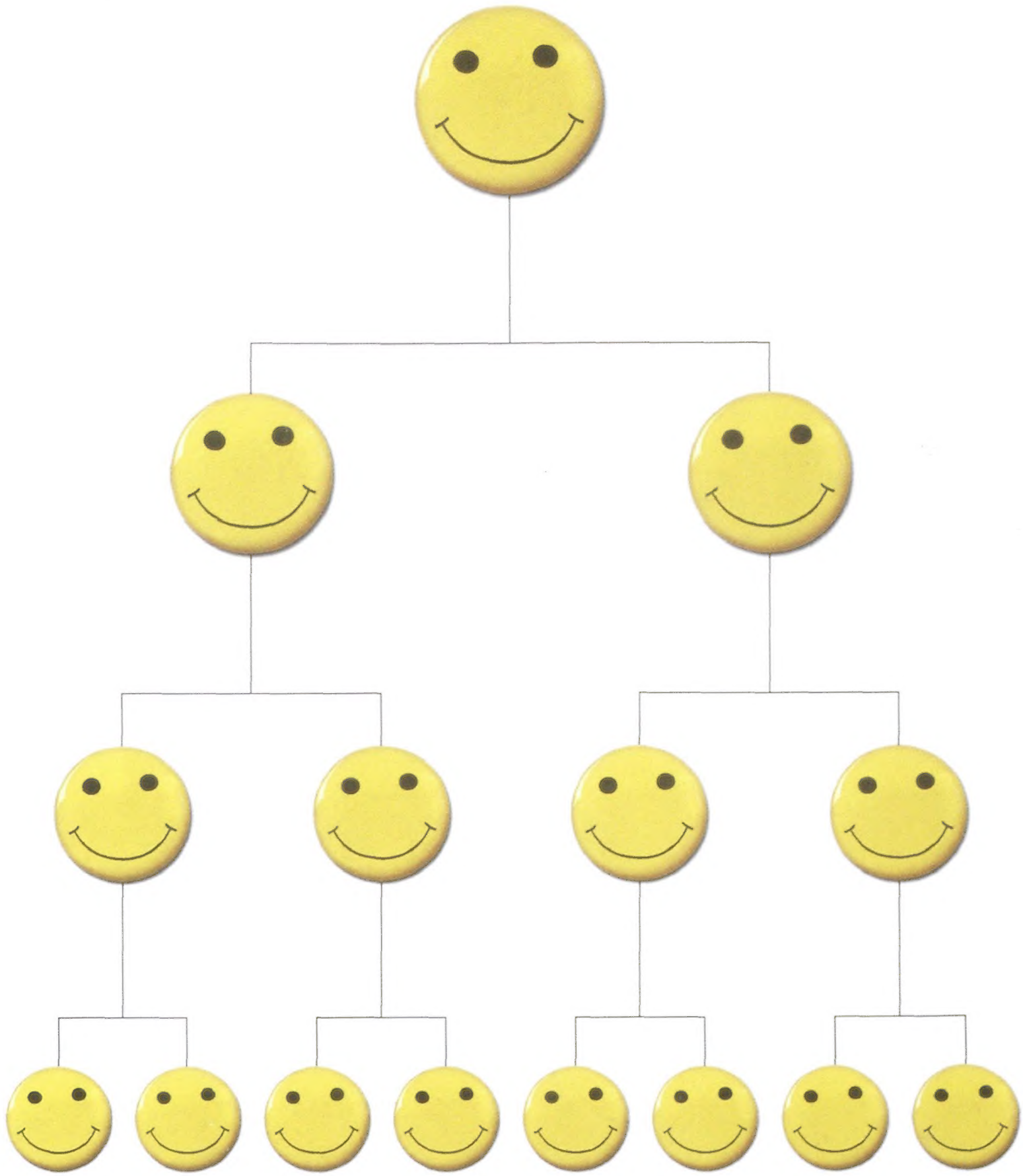

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